# CHEMICAL INDUSTRIES

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## *Word and Bond*

UPON the premise that the Constitution gives Congress the power to "coin money and regulate the value thereof" Walter Lippmann has recently argued that the gold clause deprived Congress of a right that cannot be surrendered as long as the Constitution stands unamended. In other words no individual or corporation may buy or sell for future delivery; no city or state may issue bonds; even Congress itself may not make future commitments if they attempt to define exactly the value of the dollars in which these obligations are to be discharged, because such acts would usurp the power of Congress to fix the legal tender. Mr. Lippmann makes an exception in the case of the treaty repayment to Panama on the grounds that that sovereign state has the same right to fix the legal tender within her own confines.

All of this simply ignores the right of contract. Individuals, corporations, and Government have that, and nothing in the Constitution forbids fixing the terms of repayment to be in peanuts or in diamonds. A contract once entered into is binding upon the heirs and the successors of the contracting party, and for Congress to abrogate the gold contract in its obligation is as if a sulfuric acid manufacturer who had undertaken to deliver 66 degree strength shipped oleum.

Such a repudiation is a serious matter, for the sanctity of contracts is a pillar of our civilization, and so bad an example in such times as these is of concern to us all. Our economic system is distinguished from feudalism by being operated largely through contracts, and the right to enter freely into agreements of employment, of sale, of loan, and of what not is a vastly different thing than the customs of the Middle Ages or the assignments of communism. The contract is a bulwark of economic freedom. In a republic especially the Government ought to be most scrupulous in the discharge of all its contractual obligations. The citizens should be most jealous of the good name of their Government.

This feeling has grown greatly since the air mail tragedy. It is a good sign. A revival of good faith is as healthy as a rise in carloadings and of infinitely more significance than a decline in unfilled orders for steel.

***Research and Recovery*** Faith in the future has not been lacking among the leaders of the chemical industry. Our program of new operations actually now building is ambitious and there is not a company of any importance which has not its pet projects which only await more definite assurance that recovery is real to be undertaken. In the development of the post-depression era we all believe chemicals will be a big factor, and we are ready to back this belief.

Industrial research is the most important part of our own planned future, and in these days of preparation will repay some foresighted thought. It is a trite truism that it is easier to discover a new chemical for a given use than to find new uses for a given chemical, so commercial research, a painstaking hunt for chemical opportunities in existing industries and a critical study of existing markets, is very much in order.

Every research director of experience recognizes the inestimable value of a target at which to aim. Synthetic indigo, air nitrogen, coal hydrogenation, wood saccharification, bromine from sea water, solvents from petroleum and a score of new chemicals from acetylene are all industrial monuments to the triumphs of skillful chemical research definitely aimed towards a fixed objective. Now is the time to search out such objectives and to set them up in our laboratories and pilot plants. The opportunity was never greater: the rewards will be of the same order.

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***Price Stability*** One cause of expansion of the chemical industry in the past decade has been the substitution of chemical processes in diversified fields in place of purely mechanical or physical ones. Reasons vary why chemical methods have so often proven more satisfactory—a better finished product, a more uniform product, or perhaps reduced production costs.

Back of these technical advantages is the fact that prices of basic chemicals have shown a definite long-term downward trend. As a general rule as the use, and therefore the production, of chemicals increases, prices are gradually reduced. The history of the industry bears out this statement. Further, and of equal importance, prices of industrial chemicals are not subject to violent price fluctuations.

This simply means that the manufacturer who contemplates substituting a chemical process for a mechanical or physical operation has substantial assurance that he will not be forced into gambling or hedging on raw materials, and that as time progresses it is likely that costs will gradually decrease. If the chemicals employed are relatively new and their uses expand, he stands an even better chance of a downward cost curve.

Ample statistical proof of the truth of these statements is available. The 1923 monthly average of the U. S. Department of Labor's chemical price index was 100.6 (1926=100). Ten years later it was 79.6 indicating that the long-term trend is downward. In only three years did the index rise, 1924, 1925, and 1928.

If other well-known barometers, such as the National Fertilizer Association's chemical index, *Chemical and Metallurgical Engineering's* weighted chemical index, or the *Annalist's* are studied they confirm the conclusions already drawn. *"Chem. & Met's"* index between '24 and '30 did not vary five per cent. above or below the 1927 base and in '32 it was only 15 per cent. below '27. Warren and Pearson in their controversial book "Prices" show in a splendid chart that the long-term trend of chemicals between 1798 and 1932 has been definitely and gradually downward in direction. Returning to more recent history CHEMICAL INDUSTRIES' price index of twenty industrial chemicals declined at the height of the depression only ten per cent. below January, 1931 and approximately five per cent. has been regained.

Most chemical sales executives in a general sort of way know that the long-term tendency of chemical prices is downward and that industrial chemical markets are singularly free from violent price fluctuations, despite our occasional "price wars", but have they utilized this knowledge to the fullest possible extent to increase still further chemical consumption? Manufacturers of mechanical methods and equipment are challenging in sales arguments, in some instances, the stability and long-term downward price trend of chemicals. The record, however, is clear.

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***Land vs. the Laboratory*** Some one should blazon a fair warning to all farmers, miners, and politicians that any effort to raise and maintain at artificially high levels the price of any natural material used in industry today is simply set to stimulate the use of a synthetic substitute and so defeat its own ends. Legislation supporting alcohol from corn would help corn from ethylene, and a five cent tax on imported coconut oil would do much to help introduce the sulfonated higher alcohols as detergents in the place of soaps.

# Nazi Compared With Nira

## *Control of Hours and Wages in the Chemical Industries*

**By A. Pietzsch**

**President, Industrie and Handellskammer, Munich**

ONE idea stands behind all the new legislation in Germany—the national-socialistic conception that the needs of the whole community have to be the determining force in all economic questions. Furthermore the national-socialistic conception, contrary to democracy, imposes the leadership and responsibility on one man.

The idea of National-Community is finally explained by the meaning that the working plant with all its working people is the foundation of all economics. It is therefore expected that first all the people working in the plant agree on the terms of cooperation. For this purpose a board of trustees is organized from among the laborers and officials and on which also the chief executive of the plant is a member. By this board of trustees the terms of work are discussed and agreements made. In case no agreement is brought about, the head of the plant settles the terms of labor; that is, hours and wages. If this decision is not accepted by the majority of the board of trustees, the case will come before the commissioner of labor.

For this purpose the whole German territory is divided in thirteen districts and over each district presides a commissioner of labor. This commissioner is, according to the positive declaration of the Chancellor, an independent, judicial officer of the State, who is not allowed to exercise any other function. This commissioner of labor is assisted by a committee of experts that consists of employers, office employees, and plant laborers from all the industries of his district which are of economic importance.

This committee is composed of experienced men who are sworn to judge objectively without respect to personal interests. The commissioner summons besides the committee of experts according to the suggestion of the German Laborfront a council of experts. This council of experts includes several (about 3 to 5) leaders, employees and laborers of each important economic branch in the district. The commissioner of labor summons, in case of disagreements, the members of the council and is enabled to instruct them to deal with the question at issue and to give their decision. For this purpose the council will be made up from an equal number of members of the disagreeing parties. The council has to arbitrate after hearing both parties.

This institution has been practically employed in the chemical industry for the past twelve years. As I have been active myself in such councils of arbitration, I can state that all parties are always anxious to find a reconciliation. Over 90 per cent. of all disagreements are arranged in a peaceable way by such councils. The commissioner of labor has therefore in this council of experts a means at hand through which he probably will be able to arrange most of the disagreements, not by a judicial sentence, but by a commonly found decision by both parties. This is the theory of the national-socialistic movement, namely, that mutual good-will to find a settlement will bring about the social peace and order with legal and economic justice. With today's sentiment in Germany this will be possible. In addition the laborer has full opportunity to bring up his desires and the reasons for his claims. But the employer has the same right, and as the negotiations are carried on between people whose interests are to be advocated, the old conflict of classes has been really overcome by practical collaboration.

Coming to this point it may be of interest to hear what the Chancellor of the German Reich says about the conflict of classes. He does not call the natural opposing interests and their settlement a conflict of classes; but according to his perception, a conflict of classes appears only when these naturally given contrasts are used by politicians to agitate parties of the people against each other. Just as the raising of such conflicts by especially instituted organizations (unions and employers associations) leads to an intensification of the contrast, so the mutual finding of a settlement will lead to an arrangement of the contrasts.

A court of honor has been provided by the law for social order. This comes into action when fellow-citizens who are active in the business of the nation offend against the National-Community and its social

principles. An employer, for instance, who is not working for the common best interests is in the same way liable to be called before the court of honor. So is a laborer who agitates among the working class. The court of honor is entitled to punish by fine or exclude the defendant from the plant. It is expected that the existence of the court of honor alone will largely prevent unsocial actions.

In any case where the contrary views of arguing parties cannot be reconciled there is a possibility for them to submit objectively based material on their standpoint to law consultation bureaus within the Laborfront. These bureaus are separate for employers and employees.

#### Abolition of Trade Unions

At this point something may be said about the nature of the Laborfront (Deutsche Arbeitsfront). After taking possession of power the leader of the national-socialistic movement, Adolf Hitler gave the order to break up the trade-unions which had been politically based on a conflict of classes. They had to be removed as they were hostile to the state and considering a counter-revolution. Although the organization of the Social-Democrats denied any direct connection with the Soviet movement, still within the communistic organization the revolutionary movement aiming towards a Soviet Republic was on the program and Social-Democrats and Communists went always more or less common ways. In event of a revolution one could certainly assume that the organized masses of the Social-Democrats would go on the side of Communism. At the time of the dissolution of the unions and upon prior occasions, Adolf Hitler declared repeatedly that, if the unions had been active only economically and if they had seen their task in protecting the interests of the laborers, he would have had no cause to dissolve them.

Now the whole apparatus of the unions had been united in the "German Laborfront" under the leadership of Dr. Ley. The unions themselves had great tangible investments in the form of union buildings, their own insurance companies, contracting- and consumming-communities, banks, etc., and it was naturally essential to avoid economic losses of these enterprises as their capital had been built up from the money of the German working class.

On the other side, during the development of the national-socialistic German labor party and organized by this party, so-called national-socialistic working plant units were created in the different plants. These organizations, which were held together in districts as well as centrally, had the task to win the crew of the factories for the national-socialistic idea. After the dissolution of the unions these organizations took over automatically the task of protecting the interests of the laborers, and they will also, according to the new law, develop and maintain the law consultation bureaus of the working class within the Laborfront. The consultation bureau for the employers will be instituted according to the suggestion of the executive class, but also within the Laborfront and under its leadership. The embodiment of the law consultation bureaus of both parties into the Laborfront assures cooperation of these two institutions with the goal—to settle disputes through consultation of the conflicting parties. Only if this settlement does not succeed do the organizations arranged for this eventually come into action. Then the arguing parties are to be provided from their consultation bureaus with objective material and expert advice.

To understand clearly that such an organization can serve its purpose one has only to consider that the majority of the German people are tired of quarreling and have the decided will to find the necessary settlement, within the economic possibilities while respecting the mutual interests.

From the leading position of the German Laborfront in the organizations one might rather suspect that the interests of labor would be too strongly emphasized, but almost all the employers have joined the Laborfront to respect also their interests. Thus in future a just compromise in the sense of National-Community will be secured.

Upon the passage of the law the Chancellor called the attention of the commissioners of labor to the fact that the development of wages is one of the most important factors of national economy, that it always has to be dealt with while looking towards the goal of the national interests as a whole and while remembering that one-sided wages always will be detrimental to the whole. He expects therefore a consideration of wages from the higher national-economic standpoint and consequently wants a regular interchange of ideas among the commissioners of the districts. Control of wages is secured regionally, that is, in the districts by the councils of experts of the commissioners which consist of all industries and classes of workers of the concerned district, and over the whole German economical territory control is centrally secured by the regular periodical meetings of the commissioners with their expert advisory boards to which as already said, not only employers but also employees and laborers belong.

## Manganese Ore Shipments, 1933

Shipments of manganese ore containing 35 per cent. or more metallic manganese from domestic mines (exclusive of Puerto Rico) in 1933 were approximately 18,500 long tons valued at $447,000, compared with 17,777 tons valued at $377,222 in 1932. Compared with the five-year average for 1928 to 1932, which amounted to 46,259 tons, the 1933 shipments showed a decrease of 60 per cent. Shipments of manganese ore from Puerto Rico to the United States during the eleven months ended November 30, 1933, were 1,138 long tons valued at $46,250, compared with shipments for the entire year 1932 of 2,302 tons valued at $65,509.

# Synthetic Rubber Finds Its Place in Industry

By C. A. Tyler, Ph. D.

THE synthesis of rubber has been sought by chemists for many years, stimulated from time to time by war demands or by an unusually high price for natural rubber. Only one of the many synthetic products has met with any marked commercial success. That is chloroprene rubber. The raw material, acetylene, is available in unlimited quantity and its conversion to rubber is accomplished by a relatively simple procedure. Acetylene is polymerized catalytically to monovinyl acetylene. This reacts with hydrogen chloride to form chloroprene, 2-chlor-1, 3-butadiene. Chloroprene polymerizes to form synthetic rubber.

Isoprene, mother substance of natural rubber, and chloroprene differ chemically only in that the latter has a chlorine atom in place of a methyl group in the former. The presence of the chlorine atom renders the molecule markedly polar, so that it polymerizes spontaneously far more quickly than isoprene. The product is a fully vulcanized rubber having properties similar in a general way to products obtained by vulcanizing natural rubber with sulfur. Fully polymerized chloroprene rubber resembles vulcanized natural rubber in its elastic properties more closely than any synthetic rubber previously produced. Like natural rubber and unlike any other synthetic rubber, when stretched, its X-ray diffraction pattern shows a point diagram.

Polymerization of chloroprene can be stopped at an intermediate point. In this way a plastic polymer having the general properties of unvulcanized rubber is produced. This material may be compounded with fillers, diluents, etc., the same as natural unvulcanized rubber. Polymerization or vulcanization can then be completed merely by heating for a short time when the material loses its plastic properties and becomes elastic. Natural rubber and all previously known synthetic rubbers require the addition of sulfur, sulfur chloride or a related substance, in order to effect vulcanization.

Chloroprene rubber is highly resilient, partly due to its freedom from impurities. It does not soften under the influence of heat but hardens slowly when heated at high temperatures; due to its high chlorine content is very resistant to combustion, and more resistant than natural rubber to many swelling agents. Its resistance to mineral oils is noteworthy, and is the basis for most of the practical uses of the material so far developed. It is considerably more resistant to deterioration from oxidation than vulcanized natural rubber. Chloroprene rubber is less permeable to hydrogen and helium than natural rubber; more resistant to penetration by water, and to attack by hydrogen chloride, hydrogen fluoride, ozone, and many other chemicals.

Synthetic latex can be formed by emulsifying chloroprene with Turkey-red oil, casein dispersed with sodium hydroxide or acetic acid, triethanolamine stearate, or sodium stearate, the speed of polymerization thereby becoming very great. The product, similar to a vulcanized latex, may be stabilized by adding a little ammonia. Usually the addition of an antioxidant is desirable, as this prolongs the life of articles prepared with latex. Synthetic latex is coagulated by acids, alcohol, acetone, and many salts.

Chloroprene latex can be directly applied to many uses after the manner of vulcanized natural latex. The particle size is much smaller than with natural latex, so that penetration of such articles as leather and wood is much better. Impregnated spruce becomes water-resistant but is unchanged in appearance. Synthetic latex may be used with any porous or bibulous material that does not contain inhibitors for the spontaneous polymerization of chloroprene.

#### Compounding of Chloroprene Rubber

The plastic polymer of chloroprene can be used with compounding ingredients similar to those used with natural rubber, with a number of additions. Materials such as ground leather and cork, which strongly retard the vulcanization of natural rubber, act as inert ingredients in the plastic polymer. Carbon black and zinc oxide act as reenforcing agents, as in natural rubber, and impart good abrasion resistance. In contrast to their action in rubber, whiting and clay are perfectly wet by the plastic polymer, producing compounds with good tear resistance. Cotton and other vegetable fibers are much better wet than by rubber. Most plasticizing and softening agents such as mineral oil or stearic acid have little softening action. A reasonably firm union of natural and chloroprene rubber can be obtained when they are vulcanized together under sufficient pressure. Benzene solutions of the two separate into two layers.

The rate of vulcanization of the plastic polymer of chloroprene, and the range of cure and physical properties of the vulcanized products, are profoundly affected by the addition of various metallic oxides, sulfur, certain acid softeners, and other organic compounding ingredients. The effect of various combinations of metallic oxides, sulfur, rosin, pine tar, factice,

p-coumarone and other compounding agents has been studied. For this a base of plastic polymer containing five per cent. of mineral oil and 0.5 per cent. of the antioxidant, phenyl-$\beta$ naphthylamine was used. This can be vulcanized without the addition of any other ingredient, but the product has a very low tensile strength. Compounded stocks were mixed and cured for varying lengths of time at 141° C.

Metallic oxides greatly increase the tensile strength of the product while rosin accelerates the rate of cure. Pine tar may be substituted for rosin but is somewhat less efficacious. While good vulcanized products can be obtained without the addition of sulfur, a great increase in the rate of cure and substantial improve-

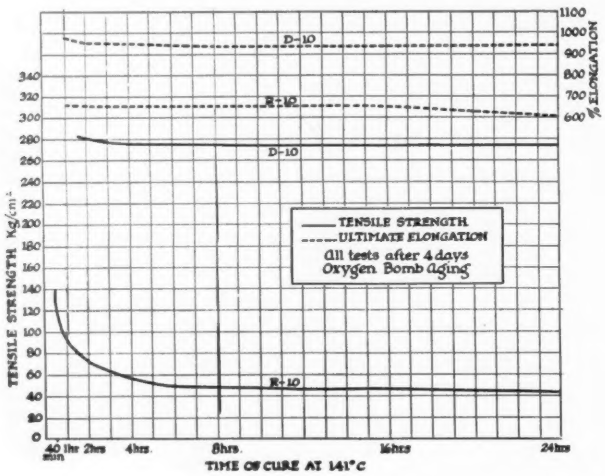

*Figure 1.*

ment in the physical properties results if a small amount is used. Factice has but little effect on the rate of cure, with a slight tendency towards acceleration. Coumarone has a distinct softening effect but does not retard the cure. In general, the plastic polymer is desirably compounded with zinc oxide, magnesia and rosin. These three ingredients used as primary vulcanizing agents have a desirable effect that cannot be obtained or even predicted from the use of any one or any two of them. Other ingredients may be added, according to the type of compound desired.

To obtain an acid-resistant compound, obviously acid-soluble pigments such as zinc oxide and whiting should be avoided. Asbestine and clay should not be used in compounds that must resist sulfuric acid. Properly compounded, chloroprene rubber is scarcely affected by cold 50 per cent. sulfuric acid. Carbon black of any of the resin-reenforcing blacks should be used as fillers. Some of the weaker organic acids have a more injurious effect than strong mineral acids. Acetic acid is more harmful than sulfuric. Chloroprene rubber can be made to resist acetic acid moderately well by loading it heavily with clay and channel carbon black. Clay is one of the worst pigments that can be used in sulfuric acid-resistant stock, but one of the best for stock to resist acetic acid. Zinc oxide, whiting, asbestine, and barytes should be avoided, either because of their reaction with acetic acid or because they produce swelling.

Caustic soda and other common alkalies have practically no effect on chloroprene rubber compounds. There are no special precautions to be observed in compounding products to resist alkalies except that factice should be avoided.

Even greater latitude is permissible in selecting compounding ingredients for chloroprene rubber than for natural. By appropriate selection and proportioning of accelerators, antioxidants, reenforcing agents, etc., and by varying conditions of vulcanization, the properties of rubber can be modified in almost any desired direction. There is, therefore, no one ideal compound, but hundreds of compounds, each intended to meet some particular set of service conditions. Therefore in comparing chloroprene rubber with natural rubber it is necessary to specify the sort of compounds used and to select those with similar composition. A comparison has been made of a typical oil-resisting natural rubber stock with a comparable chloroprene rubber compound, having compositions as follows:

| | *Chloroprene Rubber Compound* | *Natural Rubber Compound* |
|---|---|---|
| Chloroprene polymer | 100 | ... |
| Natural rubber | ..... | 100 |
| Soft whiting (40 vol.) | 85 | 112 |
| Carbon black (20 vol.) | 28.5 | 38 |
| Glue (10 vol.) | 11.5 | 15 |
| Zinc oxide | 10 | 10 |
| Light calcined magnesia | 10 | ... |
| Cotton-seed oil | 2 | 1 |
| Stearic acid | ..... | 1 |
| Wood rosin | 5 | ... |
| Phenyl-naphthylamine | 2 | 2 |
| Sulfur | 1.5 | 6 |
| Butyraldehyde aniline | ..... | 1 |

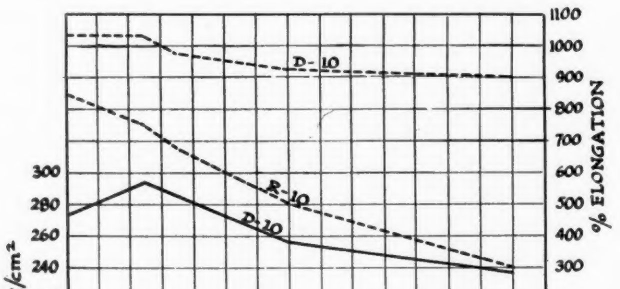

*Figure 2.*

This chloroprene rubber stock has been found to have higher tensile strength, much greater elongation, better tear resistance, about six points lower hardness at all cures, and a more rubbery feel than the corresponding natural rubber stock. It will take up considerably larger volumes of pigment than rubber without becoming stiff and boardy.

The chloroprene rubber compound swells only about 30 per cent. as much as the natural in cold kerosene, and even less in proportion in hot kerosene. Kept in hot kerosene for six days, the natural rubber compound completely disintegrates, while the chloroprene rubber compound retains a large portion of its original strength and tear resistance. Several oils and solvents other than petroleum derivatives have been tested for their swelling effect on the two compounds. The chloroprene compound swells less than rubber in typical vegetable and animal oils and maintains its physical properties well, while the natural becomes more tender. Oleic acid swells the two compounds to about the same extent but the synthetic retains its toughness, while the other becomes tender.

In turpentine the synthetic product swells considerably less than the natural compound; the latter showing a tendency to slough off. In carbon tetrachloride, trichlorethylene and other chlorinated solvents, the chloroprene compound swells as much as the rubber compound, and in benzene, creosote, toluene and xylene, even more. However, the physical properties are not affected as much as they are with natural rubber, in spite of the swelling action. Swelling tests with crude and refined petroleum are markedly in favor of the synthetic compound. The general observation is that the chloroprene compound stands up best in saturated straight-chain hydrocarbons, is affected to a greater extent by unsaturated compounds, and is especially sensitive to aromatic hydrocarbons.

In studying the effect of individual compounding agents, it was found that whiting, glue, and various grades of carbon black increase oil resistance. Glue is a particularly desirable ingredient for stocks that must resist benzene or other aromatic hydrocarbons, and is desirable in heavily loaded stocks as it makes them more easily workable. Channel carbon black is desirable where service conditions require an oil-resisting stock having also a high abrasion resistance. Semi-reenforcing blacks should be used when an oil-resistant stock of moderately high tensile strength and abrasion resistance is required. Whiting should be used as principal filler when the conditions of service do not require high tensile strength or abrasion resistance, but merely the best possible oil-resistance at the lowest possible cost.

#### Further Comparisons

Further comparisons have been made of chloroprene and natural rubber compounds, using stocks of the pure gum type, and of the type commonly used for tire treads. Their composition is given below.

In studying the time of cure in relation to its effect on tensile strength, these four compounds show a good range of cure. Optimum cure is reached in about 45 minutes at 141° C. The two chloroprene compounds have about the same maximum tensile strength, measured for various times of cure, showing that the addition of carbon black in D-11 has but little effect. On the contrary, the presence of carbon black nearly doubles the maximum tensile strength of the natural rubber compound.

The first two compounds in the table have been used to study the effect of aging. Figure 1 shows the effect of aging in an oxygen bomb at 70° C. under 300 pounds per square inch oxygen pressure when the compounds have been cured for a varying length of time. Practically, the curves suggest the better resistance of the chloroprene compound to prolonged exposure to high temperatures in service. Further tests with a definite time of cure demonstrate the high resistance of the compound to the effect of aging shown by oxygen bomb experiments (Figure 2), and by oven-aging at 100° C. (Figure 3). Properly cured, this compound shows very little deterioration in physical properties after 28 days in an oxygen bomb. Although rubber compounds can be produced to withstand this test better than R-10, no rubber compound can be produced that will withstand oxygen bomb aging as well as properly compounded chloroprene rubber.

| *Comparisons of chloroprene and natural rubber compounds* | *Gum type chloroprene compound D-10* | *Gum type rubbery compound R-10* | *Tire tread chloroprene compound D-11* | *Tire tread rubber compound R-11* |
|---|---|---|---|---|
| Chloroprene polymer | 100.0 | ..... | 100.0 | ..... |
| Natural rubber | ..... | 100.0 | ..... | 100.0 |
| Channel carbon black | ..... | ..... | 35.0 | 45.0 |
| Zinc oxide | 10.0 | 5.0 | 10.0 | 5.0 |
| Light calcined magnesium oxide | 10.0 | ..... | 10.0 | ..... |
| Phenyl-$\beta$-naphthylamine | 2.0 | ..... | 2.0 | ..... |
| Phenyl-$\alpha$-naphthylamine | ..... | 2.0 | ..... | 2.0 |
| Wood rosin | 5.0 | ..... | 5.0 | ..... |
| Sulfur | ..... | 3.0 | 1.0 | 3.0 |
| Mercaptobenzothiazole | ..... | 0.5 | ..... | 0.7 |
| Stearic acid | ..... | 1.0 | ..... | 4.0 |
| Pine tar | ..... | ..... | ..... | 2.0 |
| Cottonseed oil | ..... | ..... | 3.0 | ..... |

A common cause of failure of rubber compounds is flex-cracking. Since this type of deterioration is generally conceded to be intimately associated with oxidation, it is not surprising to find that chloroprene compounds resist flexing many times better than similarly compounded rubber stocks. Compounds D-11 and R-11 were compared on a flexing machine which makes use of a test piece with grooves molded in the outer surface and with a tire fabric reenforcement on

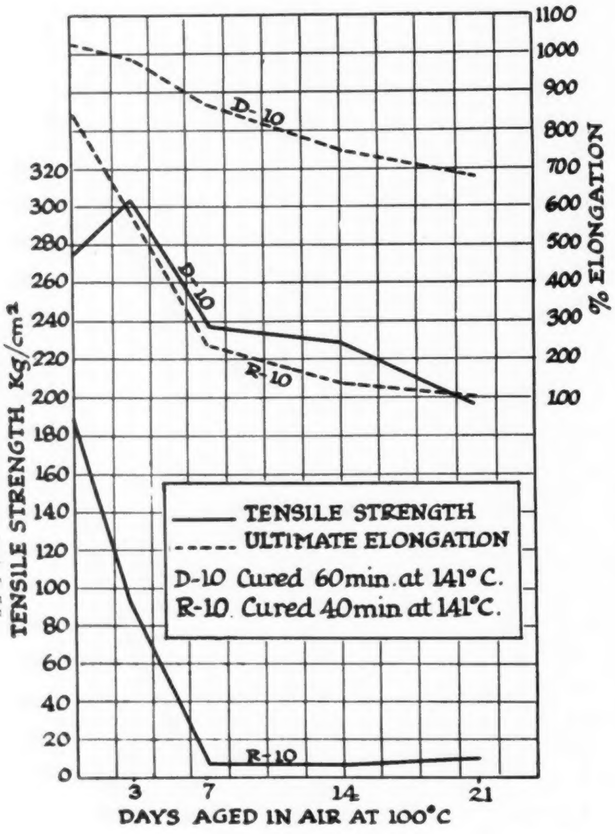


*Figure 3.*

the back. The natural compound (R-11) showed slight nicks at the base of the design after eight hours in the machine, and definite cracks in fourteen hours. At the end of twenty-four hours it was broken through to the fabric base. This is average behavior for a properly compounded tire tread stock under these testing conditions. The test on the corresponding chloroprene rubber compound (D-11) was continued for eighty hours, with no indication of failure. Figure 4 is a photograph taken after a twenty-four hour test on the natural rubber compound and an eighty-hour test on the synthetic compound.

In Figure 5 are shown stress-strain curves for the four compounds cured forty-five minutes at 141° C. The chloroprene compounds take up load more rapidly during the early stages of extension but more slowly toward the end of the extension than the corresponding natural compounds.

Abrasion resistance of the two types of compounds is a special rather than a general property, dependent on the type of abrasion in service, temperature, degree of distortion, etc. Consequently general conclusions cannot be drawn from comparative laboratory abrasion tests. Under specific conditions given in the following table, the difference between the two types of compounds was within experimental error at 28° C.

| *Compound* | *Cure at 141° C. Minutes* | *Temperature of Test °C.* | *Abrasion Loss cc./h.p./hr.* |
|---|---|---|---|
| R-11 | 50 | 28 | 177 |
| D-11 | 60 | 28 | 184 |
| R-11 | 50 | 50 | sticky |
| D-11 | 60 | 50 | 176 |

At 50° C. the natural compound softened and could not be tested. In general the abrasion resistance of rubber declines sharply with increasing temperature. Temperatures up to 50° C. appear to have little effect on the abrasion resistance of the chloroprene compound.

**Rubber Cements**

Rubber cements are made by swelling natural rubber in gasoline and other solvents. Chloroprene rubber cements may be prepared in a similar manner, but the range of available solvents is limited to the aromatic hydrocarbons and the chlorinated solvents such as carbon tetrachloride. The chloroprene plastic polymer, that is, the unvulcanized rubber, is not soluble in gasoline and other petroleum fractions. Chloroprene rubber cements are generally better adhesives than natural because the unvulcanized form of the first is tougher and less extensible. The properties of chloroprene rubber are unaffected by dissolving it and removing the solvent by evaporation, whereas rubber appears to undergo some form of deaggregation.


*Figure 4. Flex-Cracking Tests.*

The manufacture of chloroprene rubber products as an industry, is still in its infancy. The company holding the patent rights of the plastic polymer described above, uses it for the manufacture of hose, gaskets, packing, belts, covered rolls and various other finished products.

One of the principal uses for chloroprene rubber is in the manufacture of hose to conduct crude oil, re-

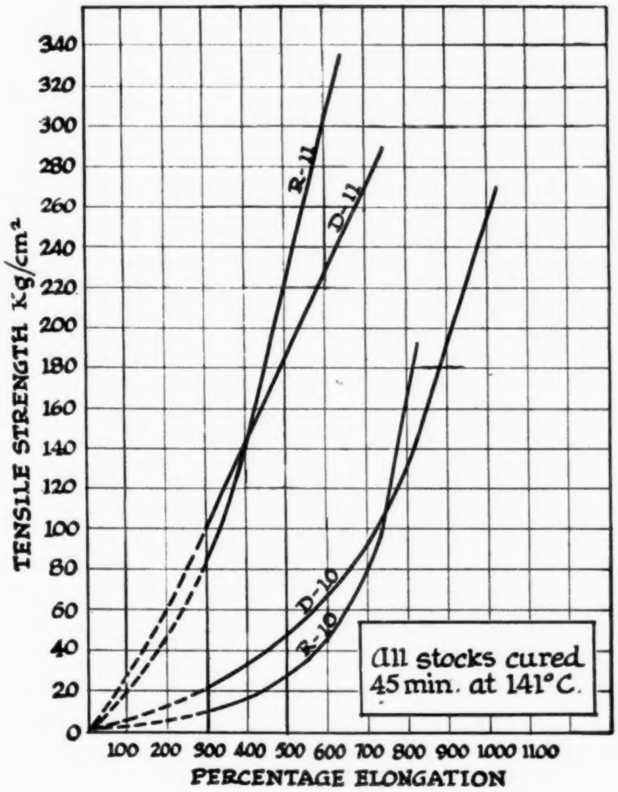


*Figure 5.*

fined petroleum products, paint, lacquer solvents and similar materials that deteriorate natural rubber badly. Another important use is in gaskets, packing, pipe rings, wire insulation, sponge to absorb vibration from motors, etc., which must have the strength, resilience and toughness of rubber and at the same time needs to be more resistant to oil and heat than natural rubber. Covered rolls are manufactured that are subjected to higher temperatures than natural rubber will withstand, or to chemicals which attack and decompose rubber. Gaskets, insulators and oil-resisting rings of chloroprene rubber are used in the automobile industry. Another application utilizing the oil-resisting property is in the manufacture of bulbs to go on medicine droppers. Used with oily medicinals, the natural rubber bulbs soon become worthless. This may be of minor commercial importance, but it is suggestive of possibilities.

Oil-resistant sheet packing of chloroprene rubber is sold in a range of densities, hardnesses and plasticities to meet service needs. It is offered in black, red or white; and recommended where long service is the prime consideration.

## Neon Advertising Signs

The discharge tubes used for advertising signs are a development of the old Geissler and Crookes tubes in which various beautiful effects were produced when evacuated tubes filled with certain gases were excited by an induction coil. Forty years ago, the gases used were mostly nitrogen and carbon dioxide, and these required continual replenishing. It was only when the rare gases, argon, neon, helium, etc., were experimented with that it was found possible to obtain a reasonably permanent luminous discharge. These gases are not subject to absorption to anything like the same extent as the commoner gases. Neon at a suitable pressure gives more visible light and has a lower electrical resistance than the other permanent gases, hence a greater length of tubing can be operated for a given voltage. Neon has a cheerful red glow, argon gives a faint lavender color and has little luminosity, and helium has a whitish glow. Combinations of various gases and vapors with neon and the use of colored glass tubes have enabled many striking and pleasing colored effects to be obtained. The positive column extending to the anode forms the main region of luminosity in the tube. By mixing traces of impurity in the gas, it is possible to obtain narrow cords of light which move within the tube and give rise to the type of discharge known as the "ripple neon". Sometimes also the column of light splits up into rows of colored discs which often rotate round the axis of the tube. These effects are known as "striations". Alternating current is used for operating commercial tubes. As the voltage absorbed under running conditions is about 200 volts per foot of tube, it is usually divided up into a number of sections each supplied by a separate transformer.

## Zinc Dust Precipitation of Gold

Valuable information regarding the difficulties encountered in the precipitation of gold by zinc dust and the treatment of the precipitate at the Golden Cycle Mill, Colorado, is given in a recent publication of the United States Bureau of Mines. Zinc shavings contained in zinc boxes were formerly used for the precipitation of gold from cyanide solutions. Since 1929, precipitation has been effected with zinc-dust and Merrill presses have been used for the recovery of the precipitate. The solutions are passed through Crowe vacuum equipment before precipitation. The barren solution, which contains 0.02 ounce of gold per ton, flows into sumps and is used as wash solution for both sand and slime treatments.

When zinc shavings were used for precipitation, the zinc boxes were cleaned up by removing the contents from the first or first and second compartments of the seven compartment boxes. The precipitate was treated with sulfuric acid in a tank. When most of the zinc had dissolved, the sludge was dropped into a small air-tight tank and from there forced by air pressure into a small clean-up press. The gold sludge was washed in this press with hot water for the removal of zinc sulfate. The press was then dismantled, the sludge cake removed, and charged into a muffle type furnace. The muffle was brought to a red heat and most of the lead and any remaining zinc oxidized. The roasted product was mixed with flux in the proportion of 100 lb. of residue to 84 lb. of flux. The flux contained 28 lb. of silicious sand, 28 lb. of bicarbonate of soda, 14 lb. of borax glass, and 14 lb. of fluorspar.

When the change from zinc shavings to zinc-dust was made, the sulfuric acid treatment was discontinued. The precipitate, after removal from the Merrill press, is now put into iron pans and mixed, while wet, with sodium nitrate in the proportion of 125 lb. of precipitate to 25 lb. of nitrate. The pans are placed in a furnace equipped with cast-iron muffles and the charge is heated to a red heat. The heating results in the drying and sintering of the charge, which may be subsequently handled without loss of dust. The bullion is then mixed with the sand-borax glass-soda nitrate-fluorspar flux, previously noted, and charged to a fire-clay, tile-lined, Monarch-Rockwell type of furnace for melting.

# Investment Trusts Appraisal of Chemical Industry Future

By Fred A. Hessel

THE chemical industry, composed of units producing a great variety of products, would seem to be an ideal field of investment for management trusts. A diversification of holdings has ever been the keynote of their policy. By the purchase of many different kinds of securities managers of investment trusts seek to eliminate the possibilities of risk and to offer their stockholders a share in the profits of a variety of industries. And it is certainly consistent with this policy to invest in chemical stocks. For to hold Industrial Rayon, Colgate, United Carbon and Newport Industries stocks, for instance, is to have nearly as diversified a portfolio as to invest in the automotive and tobacco industries, railroads and food.

It was therefore always a matter of surprise to us that for some time the chemical holdings of the large investment trusts were comparatively small, and we were so bold as to predict two years ago, that the percentage and variety of these holdings were bound to increase as the investment managers became better acquainted with the possibilities of the chemical industry. We were accordingly pleased to note that in 1933 chemical stocks figured more conspicuously on the investment lists of several of the leading trusts.

One of these, Lehman Corporation, had increased the amount of their chemical commitments from 5.7 per cent. in 1930 to 8.1 per cent. in 1933, of their total holdings of common stocks.

**Table 1.**

**Lehman Corporation**

| | *1930* | *1931* | *1932* | *1933* |
|---|---|---|---|---|
| Total stocks.. | $70,211,831 | $40,581,826 | $41,575,765 | $49,114,410 |
| Chemicals.... | 3,500,315 | 708,477 | 1,151,437 | 3,597,565 |
| % Chemicals. | 5.7 | 2.2 | 3.4 | 8.1 |

But Lehman Corporation is only one of several leading investment trusts to show more interest in chemicals during the last year. Out of the seven listed in Table 2, five trusts held more chemical stocks in 1933 than in 1929 and three of the five had more

| TABLE III | DUPONT | | | | | UNION CARBIDE | | | | | ALLIED CHEMICAL | | | | | EASTMAN KODAK | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1929 | 1930 | 1931 | 1932 | 1933 | 1929 | 1930 | 1931 | 1932 | 1933 | 1929 | 1930 | 1931 | 1932 | 1933 | 1929 | 1930 | 1931 | 1932 | 1933 |
| Adams Express | -- | 2000 | -- | 1000 | -- | 1000 | 10000 | 12200 | 13200 | 12200 | -- | 1050 | 1450 | 3500 | 3000 | -- | 4500 | 4500 | 4500 | 4500 |
| Gen. American Investors | -- | -- | -- | -- | 4000 | 8000 | 2000 | -- | -- | -- | -- | -- | -- | 5500 | 6000 | -- | -- | -- | -- | -- |
| Incorporated Investors | 18000 | 18600 | 13600 | 15000 | 15000 | 22700 | 23600 | 24000 | 25000 | 20000 | 8200 | 9000 | -- | 5000 | -- | -- | 6200 | -- | -- | -- |
| Lehman Corporation | -- | 3000 | -- | -- | 14000 | 9700 | 14700 | 4800 | 10000 | 14000 | -- | 2100 | -- | 5000 | -- | 3800 | 3000 | -- | -- | -- |
| Capital Administration | 500 | 1000 | -- | 500 | 500 | 4000 | 5000 | -- | 500 | 1000 | -- | 550 | -- | -- | -- | -- | -- | -- | 750 | 500 |
| Vick Financial Corp. | -- | 500 | -- | -- | 1000 | -- | -- | -- | -- | -- | 2200 | -- | 800 | -- | 1500 | -- | -- | -- | -- | 1000 |
| Tricontinental | 6500 | 2700 | 1000 | 1000 | 1700 | 18860 | 14000 | -- | 1000 | 6000 | 1000 | 1700 | -- | 2500 | 500 | 5300 | 2000 | -- | 4000 | 5000 |
| | NATIONAL DISTILLERS | | | | | AMERICAN CYANAMID | | | | | DOW CHEMICAL | | | | | COLGATE | | | | |
| Adams Express | -- | 5000 | 5000 | 15500 | -- | 4000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Gen. American Investors | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Incorporated Investors | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4600 | -- | -- | -- | -- | -- |
| Lehman Corporation | -- | -- | -- | -- | 31500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5400 | -- | 4800 | -- | -- | -- |
| Capital Administration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1000 | -- | -- | -- |
| Vick Financial Corp. | -- | -- | -- | -- | 1800 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 300 | -- | -- |
| Tricontinental | -- | -- | -- | -- | 7000 | 4000 | -- | -- | -- | 1000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | SCHENLEY | | | | | FREEPORT TEXAS | | | | | MATHISON ALKALI | | | | | U. S. IND. ALCOHOL | | | | |
| Adams Express | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7300 | 17600 | 20000 | 20000 | 15600 | -- | -- | -- | -- | -- |
| Gen. American Investors | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3000 | -- | 2000 | 10000 | -- |
| Incorporated Investors | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 11500 |
| Lehman Corporation | -- | -- | -- | -- | 6900 | -- | -- | -- | 9000 | 11500 | -- | -- | -- | -- | -- | -- | -- | -- | 6400 | -- |
| Capital Administration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1000 |
| Vick Financial Corp. | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tricontinental | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2000 |

**Table 2.**

| *Investment Trusts* | *Number Chemical Companies Represented* | | | | | *Total Number Shares of Chemical Stocks* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *1929* | *1930* | *1931* | *1932* | *1933* | *1929* | *1930* | *1931* | *1932* | *1933* |
| Adams | 4 | 8 | 6 | 8 | 5 | 15,360 | 48,150 | 48,150 | 63,200 | 40,300 |
| General American | 5 | 1 | 1 | 3 | 3 | 21,030 | 2,000 | 2,000 | 20,500 | 14,000 |
| Incorporated Investors | 5 | 6 | 3 | 5 | 8 | 73,500 | 83,400 | 47,600 | 57,000 | 88,600 |
| Lehman Corporation | 3 | 6 | 2 | 5 | 13 | 20,500 | 41,600 | 12,300 | 32,400 | 124,700 |
| Capital Administration | 2 | 3 | 1 | 6 | 7 | 4,500 | 6,550 | 500 | 7,050 | 5,100 |
| Tricontinental | 7 | 4 | 1 | 6 | 11 | 49,500 | 20,400 | 1,000 | 14,900 | 30,600 |
| Vick Financial Corp | 3 | 4 | 2 | 0 | 9 | 6,900 | 6,000 | 11,000 | ..... | 12,300 |

than doubled their chemical commitments. It is also significant that six of the seven had a greater variety of chemical stocks in 1933 than in 1929.

It is interesting to follow the new interest of the investment trusts in the chemical industry. Table 3 in which the chemical companies are listed according to size, shows the number of shares of each of them held by the various trusts during the last five years. One is struck, first by the fact that relatively few units in the industry figured on the lists of the investment trusts in 1929, 1930, 1931, and even as late as 1932, however, a wide variety of chemical stocks appeared in 1933. This is especially true of Lehman Corporation's portfolio. Their list of chemicals in 1929 was restricted to three leaders: Union Carbide, Eastman Kodak and Air Reduction. But last year, they held 13 different chemical stocks, including: Union Carbide, Air Reduction, Du Pont, Texas Gulf, Freeport Texas, National Distillers, Schenley, Dow, Monsanto, Columbian and United Carbon, Industrial Rayon and Sherwin Williams; Tricontinental, with a list of seven chemicals in 1929 (Du Pont, Union Carbide, Allied, Eastman Kodak, Air Reduction, Commercial Solvents and American Cyanamid) held eleven in 1933, having dropped Commercial Solvents and added National Distillers, U. S. Industrial Alcohol, American Commercial Alcohol, Hercules and Atlas. Like Lehman Corporation, Vick held only three leaders in 1929, Allied, Texas Gulf, Air Reduction, but last year added Du Pont, Industrial Rayon, Eastman Kodak, National Distillers, Monsanto and Freeport Texas.

It is also apparent that whereas five years ago only the leaders in the industry were familiar to investment managers, last year several of the small units attracted their attention. Most of the twelve chemical stocks listed in 1929, by the seven trusts shown in Table 3 were leaders, but we find that the twenty-two chemicals listed in 1933 includes both large and small units. Those that appeared in 1933 for the first time on any of the investment trust lists were: Dow, Atlas, Hercules, United Carbon, Columbian Carbon, Industrial Rayon, Sherwin Williams, Schenley, American Commercial Alcohol, Freeport and National Distillers.

As the number of smaller companies has increased on the lists of the investment trusts, the relative importance of the leaders, with only one exception, has declined. Turning to Table 4 we find the various chemical companies listed in order of their share, in 1929, of the chemical holdings of the seven investment trusts named in Table 3. Figures for that year and for 1933 are given, showing to what extent the percentages of the leaders had changed and how

| TABLE III | PROCTOR & GAMBLE | | | | | TEXAS GULF | | | | | COMMERCIAL SOLVENTS | | | | | AIR REDUCTION | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1929 | 1930 | 1931 | 1932 | 1933 | 1929 | 1930 | 1931 | 1932 | 1933 | 1929 | 1930 | 1931 | 1932 | 1933 | 1929 | 1930 | 1931 | 1932 | 1933 |
| Adams Express | -- | -- | -- | -- | -- | 4000 | -- | -- | 500 | -- | -- | 5000 | 5000 | 5000 | 5000 | -- | 3000 | -- | -- | -- |
| Gen. American Investors | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5000 | -- | -- | -- | -- | 3000 | -- | -- | -- | -- |
| Incorporated Investors | 15600 | 17000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 15000 | 9000 | 9000 | 10000 | 12500 | 10000 |
| Lehman Corporation | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6000 | -- | -- | -- | -- | -- | 3000 | 14000 | 7500 | 2000 | 2200 |
| Capital Administration | -- | -- | -- | -- | -- | -- | -- | -- | 800 | -- | -- | -- | -- | 3000 | -- | -- | -- | 500 | 1500 | 600 |
| Vick Financial Corp. | -- | -- | -- | -- | -- | 2500 | 2000 | -- | -- | 2000 | -- | -- | -- | -- | -- | 2200 | 2500 | 300 | -- | 1000 |
| Tricontinental | -- | -- | -- | -- | -- | -- | -- | -- | 2400 | -- | 7300 | -- | -- | 2600 | -- | 2600 | -- | -- | 4000 | 1000 |
| | HERCULES | | | | | MONSANTO | | | | | SHERWIN WILLIAMS | | | | | COLUMBIAN CARBON | | | | |
| Adams Express | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Gen. American Investors | -- | -- | -- | -- | -- | 2030 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Incorporated Investors | -- | -- | -- | -- | 8500 | -- | -- | -- | 4000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lehman Corporation | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7200 | -- | -- | -- | -- | 5000 | -- | -- | -- | -- | 3000 |
| Capital Administration | -- | -- | -- | -- | 700 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vick Financial Corp. | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tricontinental | -- | -- | -- | -- | 2000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | INDUSTRIAL RAYON | | | | | UNITED CARBON | | | | | AM. COM. ALCOHOL | | | | | ATLAS | | | | |
| Adams Express | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Gen. American Investors | -- | -- | -- | 5000 | 4000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Incorporated Investors | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lehman Corporation | -- | -- | -- | -- | 6000 | -- | -- | -- | -- | 12000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Capital Administration | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 800 |
| Vick Financial Corp. | -- | -- | -- | -- | 1000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tricontinental | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1000 | -- | -- | -- | -- | 3400 |

**Table 4.**

| Chemical Companies | Amount invested by trusts 1929 | Amount invested by trusts 1933 | % of total invested in chemical shares 1929 | % of total invested in chemical shares 1933 |
|---|---|---|---|---|
| Union Carbide | $5,076,540 | $2,401,400 | 24.9 | 13 |
| Allied Chemical | 5,023,650 | 1,628,000 | 24.7 | 8.8 |
| Du Pont | 2,925,000 | 3,475,200 | 14.4 | 18.8 |
| Air Reduction | 2,375,000 | 1,465,200 | 11.6 | 7.9 |
| Eastman Kodak | 2,318,000 | 891,000 | 11.5 | 4.8 |
| Proctor & Gamble | 842,400 | ...... | 4.1 | .... |
| U. S. Industrial Alcohol | 411,000 | 768,500 | 2.1 | 4.2 |
| Commercial Solvents | 381,300 | 640,000 | 1.9 | 3.6 |
| Texas Gulf | 357,500 | 320,000 | 1.8 | 1.8 |
| Mathieson Alkali | 284,700 | 561,600 | 1.4 | 3 |
| American Cyanamid | 224,000 | 16,000 | 1.1 | .1 |
| Monsanto | 99,470 | 672,400 | 0.5 | 3.6 |
| Freeport | ...... | 1,057,500 | .... | 5.8 |
| National Distillers | ...... | 1,047,800 | .... | 5.7 |
| Industrial Rayon | ...... | 880,000 | .... | 4.8 |
| Dow | ...... | 715,400 | .... | 3.9 |
| Hercules | ...... | 683,200 | .... | 3.8 |
| United Carbon | ...... | 456,000 | .... | 2.5 |
| Sherwin Williams | ...... | 240,000 | .... | 1.4 |
| Schenley | ...... | 207,000 | .... | 1.2 |
| Columbian Carbon | ...... | 183,000 | .... | 1 |
| Atlas | ...... | 159,600 | .... | .9 |
| American Commercial Alcohol | ...... | 53,000 | .... | .3 |
| TOTAL | $20,318,560 | $18,521,800 | 100% | 100% |

altogether they represented a much smaller proportion of the total chemical holdings in 1933 than in 1929.

With regard to individual stocks we find that Union Carbide had lost its leadership to Du Pont, its percentage shrinking from 24.9 per cent. to 13 per cent. while Du Pont rose from 14.4 per cent.and second place in 1929 to first place and 18.8 per cent. in 1933. No other stocks showed over 10 per cent. in 1933, while in 1929 the amounts invested in Allied, Air Reduction and Eastman Kodak were all over 10 per cent.

Whether or not this newly awakened interest in the chemical industry as a whole will be permanent, cannot of course, be predicted here. But it is our belief that having once investigated the possibilities and potentialities of chemical companies, investment managers will continue to increase their chemical holdings.

## German Potash Fertilizer Industry on Upswing

German potash trade registered a decided upward swing in January, according to a report made public by the Commerce Department. Germany's domestic sales of the pure potash totalled 180,000 metric tons in January compared with only 76, 000 metric tons in January, 1933, according to reports of the German syndicate which controls the industry. Heavy gains in exports were also recorded.

Shipments of manure salts advanced spectacularly to 61,960 tons (bulk weight) from only 36,551 tons in December and 17,777 tons in January, 1933. Exports of sulfate in January totalled 22,959 tons, an increase of 11 per cent. compared with January, 1933, and January, 1932.

These heavy increases in exports were not attained however, without reducing price levels. The average price of raw salts exports in January, 1934, was only 35.00 marks per metric ton compared with 53.27 marks in January, 1933. Sulfate prices declined from 138.71 to 91.04 marks per ton. A conference was held at Nice late in February between representatives of the Franco-German potash bloc and Spanish producers with the view to effecting an export agreement. While it is reported that the conference did not achieve positive results, it is believed the meeting was helpful in clarifying the position of the respective groups and that the discussions might possibly lead to an agreement later as the way was left open for further negotiations.

The United States is still one of the world's largest importers of potash fertilizer materials but now obtains an appreciable portion of the requirements from domestic sources. In 1933 United States imports of such material amounted to 282,570 tons, valued at approximately $8,760,000, compared with 273,800 tons, valued at $6,539,500, for the preceding year.

## Explosives Sales Increased Nine Per Cent. in 1933

The quantity of explosives manufactured in the United States and sold during 1933 for use in mining and quarrying, and for other industrial purposes, amounted to 255,989,391 pounds, according to reports from companies engaged in the manufacture of explosives. This figure represents an increase of nine per cent. over the quantity sold in 1932. Sales during 1933 included 64, 210,675 pounds of black blasting powder, 33,927,443 pounds of permissible explosives, and 157,849,273 pounds of other high explosives. (Permissible explosives are high explosives that have passed certain tests by the United States Bureau of Mines to determine the relative safety and suitability of the explosives for use in coal mines). When compared with 1932, the quantities of explosives sold in 1933 represented an increase of five per cent. for permissible explosives, 14 per cent. for other high explosives, and less than one per cent. for black blasting powder. Mining and quarrying operations used 99 per cent. of the total quantity of permissible explosives, 51 per cent. of the total quantity of other high explosives, and 92 per cent. of the total quantity of black blasting powder.

# The Development of Water Wax Emulsions

## By Dr. C. F. Mason

WAX finishes for floors have been used for generations and at first consisted of bees wax which had been hydrolyzed in the presence of caustic alkali to form a cream. These were developed in Germany and used up to about 1870 when Carnauba and other hard waxes were dissolved in volatile solvents to form either a liquid or a paste depending upon the quantity of solvent used. These pastes and liquids were difficult to apply and required buffing to produce a bright finish, but a durable film remained and was waterproof with the disadvantage of being slippery.

However a demand arose for a floor wax which could be spread and polished with less labor. This need was particularly acute in large public buildings where linoleum, cork, rubber and wood floors were subjected to severe treatment. This demand was partially met by manufacturing chemists who chose the easiest course by emulsifying Carnauba wax in water with castile soap to produce a cream which had only one merit, ease of spreading, but it still required buffing and the resulting film of wax and soap in the ratio of 4 to 1 respectively was not waterproof, rather soft and became slippery and spotty under wet feet.

This condition continued until about 1930 when tri-ethanol-amine was offered for sale. This compound is a mild base which can be combined with organic acids to form soaps, smaller quantities of which are necessary to emulsify the same quantity of Carnauba wax, and the resulting emulsion possesses a viscosity very near to that of water. Moreover, cut shellac solutions can be added to it without any appreciable effect upon the thickness and with better spreading power.

This was a step forward in that it was spread by an inexpensive mop, it dried bright without buffing and the resulting film contained wax, soap and shellac in the ratio of 5-1-1 respectively. This film was not slippery, wore well, could be applied often but it was not waterproof. When the report of this compound was brought to the attention of small producers of household specialties, a stampede started and new water wax emulsions appeared in the market weekly. A total capital of $300 was adequate to start a novice in this field of chemical manufacturing because the formula was supplied free either by a government bureau or a company which sold any of the compounding substances. The writer recalls one instance where a producer was melting the wax in a copper wash boiler over a free gas flame and pouring this half charred mass into lukewarm water in which the emulsifiers had been dissolved.

The need of a dry bright waterproof floor wax emulsion prompted some producers to seek improvements and as usual they followed the beaten path by lessening the content of tri-ethanol-amine soap and substituting for part of it a sodium soap of the free acid present in Carnauba wax. This was an improvement but sacrificed some of the dry brightness, and others maintained the usual finish but introduced various forms of paint driers a few of which were lead, manganese and cobalt linoleates. As a result of these developments fear arose that floor wax emulsions might soon contain substances detrimental to the life of floor coverings and specifications for purchase of them were drawn up.

### Specifications

The General Supply Committee of The U. S. Treasury Department on February 3, 1933 issued specifications for purchase of these materials, and the essential points are listed below:

Total non-volatile solids not less than 20 per cent.

Solids other than emulsifier must be No. 1 Carnauba wax and contain not less than 15 per cent.

It must be a perfect emulsion, no volatile solvents like alcohol, benzine, turpentine, naphtha or gasoline are allowed.

It shall not re-emulsify after application.

It shall spread evenly and easily.

It shall dry in not more than 30 minutes.

It shall not check, crack, peel, show overlap, contain objectionable odors, remain sticky.

It must be a neutral liquid.

The film must be transparent and colorless.

The film must withstand water at least for two hours without marked effect.

It shall give a high lasting gloss when diluted with water, and have a coverage of 2,500 square feet per gallon.

The Rubber Flooring Manufacturers' Division of The Rubber Manufacturers' Association has adopted specifications for water wax emulsions with the sole purpose of protecting rubber floors. They specify Carnauba wax with some bees wax and shellac, and prohibit rosin, free caustic alkali, copper, manganese, free oil or volatile solvents. It seems fairly easy to meet the requirements for rubber floors but next to impossible to find an emulsion on the market today which will meet the demands for use in federal buildings.

The federal authorities expect more than the properties of the best formula issued by The U. S. Department of Commerce. This emulsion contains Carnauba wax, oleic acid, tri-ethanol-amine, borax, shellac, ammonia and water. The resulting film contains Carnauba wax, soap, borax, and shellac in the ratio of 72-20-5.4-10 respectively and it is obvious that soap and borax are very soluble in water. These soluble substances are spread uniformly through the film and when dissolved by contact with water will result in white spots, a slippery condition and even chances of damage suits.

The writer now has in his laboratory ten popular brands of emulsions, six of which dry bright and the other four dry with a haze which must be rubbed off to produce a polish, two show some resistance to water but leave spots when this water has evaporated, and the remaining eight are re-emulsified simply by contact with cold water and the pressure of the wet foot forms a pool resembling milk. Three have hardened in the can to a solid mass which is not redispersed by vigorous shaking, and two contain free alkali. Two which dried the brightest were the best emulsions but were least water resistant and this would indicate that tri-ethanol-amine oleic acid soaps produce good emulsions under proper conditions only when the concentration is higher than that specified in the report. Difficulties encountered with this emulsifier may be attributed to incomplete emulsification which results in the larger particles of semi-emulsified wax rising to the surface during drying and leaving a flat film.

Bases are available which could form soaps with water insoluble organic acids and these soaps after serving as emulsifiers could undergo decomposition in the film by evaporation of one ingredient leaving a film of shellac, wax and acid which would dry bright and resist water. However present theories of emulsions applied to this problem and more suggestions about a wiser choice of basic substances must be dispensed with in this report.

### Future Prospects of Floor Wax Emulsions

It is apparent that intensive effort by a technically trained organization of chemists is necessary to produce a water wax emulsion which will meet all specifications laid down and also the most pressing needs of users. However the producers of these household specialties feel that they are chemists themselves and are willing to do their own experimenting or wait for a large company to announce the sale of a waterproof emulsifier. Therefore progress in this field may be slow unless an association of floor wax producers appropriate a sum of money to retain a chemist for the solution of this and similar problems. In view of the present difficulties floor wax emulsions may be a flash in the pan and off the market in the near future because the advantage of less labor in application is offset by unsightly spots in wet weather, and unless this is soon remedied a prejudice may arise and result in a return to wax solutions and pastes.

# *The Industry's Bookshelf*

**Elementary Statistical Methods,** by E. C. Rhodes, 243 pages, illustrated with charts. George Routledge & Sons, Ltd., 68 Carter Lane, London, E. C. 4. Price 7s. 6d. net.

Now that *laissez-faire* is to be replaced by either a planned or a controlled economy, it is going to require a much better statistical background of production and of sales, and this lucid account of statistical methods can be widely read with great profit by both technical and business men. The illuminating illustrations drawn chiefly from actual industrial or commercial conditions, explain all of the simple, statistical methods, and a valuable part of the book lies in the emphasis it places upon the proper valuation of the sources of statistics and their methods of interpretation.

**Prohibiting Poverty,** by Prestonia Mann Martin. 125 pages. Farrar and Rinehart, 9 East 41 st st., New York City. Price $1.00.

If you happen to be one of those who have not read Mrs. Martin's prescription for universal security and comfort, you have missed a good dose of mental tonic. Her solution is extremely enticing. It certainly leaves a chemical man wondering whether the manufacture of sulfuric acid is obviously a necessity and how the other branches of the chemical industry are to be so classified. It is certainly a book well worth reading.

**Trade Associations,** by W. J. Donald, 437 p., published by McGraw-Hill Book Co., 330 W. 42 st., N. Y. City. $4.00.

NRA and the so-called "New Deal" means much greater importance in business life for the trade association. This most exhaustive study of the various angles of trade association work was designed first, for the business man who wishes to know how a trade association may and should be organized, the management policies it should follow, the voluntary and employed personnel that should be selected, and the activities and results it may achieve. Second, for the potential association executive or the new executive who desires guidance in proper methods of association management, organization, and procedures.

**Outlines of Organic Chemistry,** by F. J. Moore, revised by William T. Hall. 338 p., published by John Wiley & Sons, 440 4 ave., N. Y. City. $2.75.

A textbook designed primarily for those not requiring the rigorous detailed study of organic chemistry in preparation for a career in this field, but for those intending to engage in other industries where a fundamental knowledge of the principles of organic chemistry are essential. Originally the textbook contained a large part of the lecture-work of the late Dr. F. J. Moore and this has been thoroughly revised and brought up-to-date in this the 4th edition.

**Gold and Your Money,** by Willard Atkins, 155 p. Robert M. McBride & Company, New York. $1.75.

It is perfectly true, as the publisher says, that anyone who reads the newspapers can understand this capital, elementary exposition of monetary fundamentals, and that any reader will get from it a clear idea of the conception of the orthodox economist, the Warren School, and even of Father Coughlin.

**Dollars,** by Lionel E. Edie, 294 p. Yale University Press, $2.50.

Professor Edie's book is a valuable contribution to the current literature on monetary problems. The explanations of the basic principles are solid and satisfying; not only clear but extremely interesting. More than this it discusses intelligently and fairly the current economic theories regarding money and its control, and sets forth his own ideas as to a financial system for the U. S. which would satisfy the requirements of stability and elasticity. The book has been a best seller in several cities and certainly deserves to be.

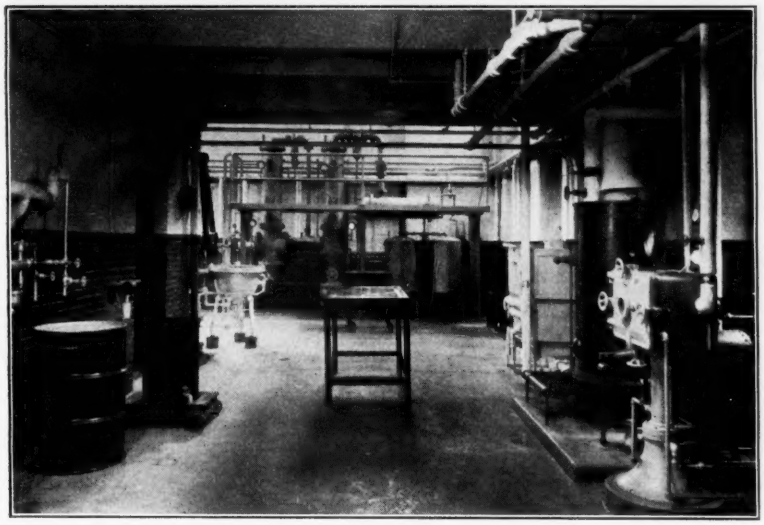

*Figure 1—View of chemical engineering laboratory.*

# Operating a Semi-Works Chemical Plant


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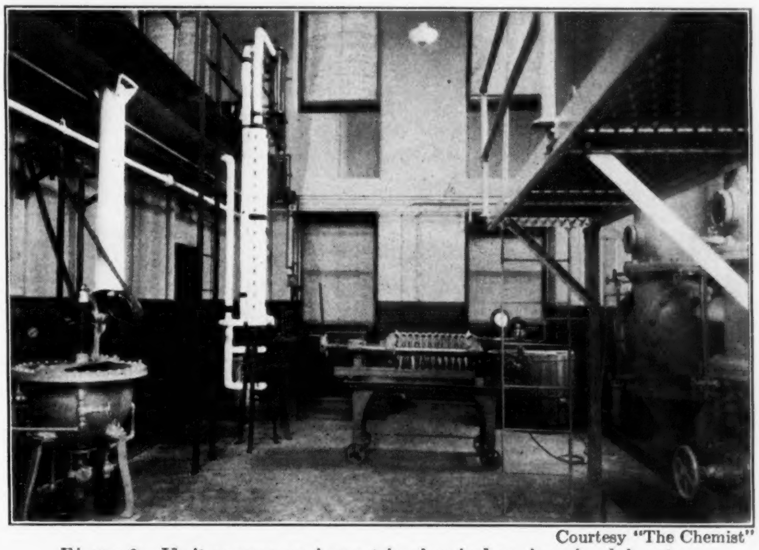
THE translation of a new chemical process from the research laboratory to the actual plant operation is often an expensive and complex procedure. The technical and economic advantages involved in a step by step procedure operating on progressively increasing scale and a careful analysis of the results of each stage have been repeatedly emphasized. They are rapidly becoming well recognized. The number, character, and scale of the successive development stages in the individual case are dictated largely by the process and the previously available information and experience. However, the first stage in the actual translation to the plant is ordinarily the semi-plant.

The economic importance of a semi-plant scale laboratory to the average chemical manufacturing organization today cannot be overemphasized. That this viewpoint is held by a very large number of chemical executives and concerns is witnessed by the many extensive and excellent semi-plant and development laboratories which are maintained. There are, however, even within the field of the writer's limited knowledge many chemical manufacturers who do not so regard it, particularly in certain branches of the chemical industry. Even to the smaller concern whose resources may permit only a few essential items of semi-plant equipment and a very limited personnel the financial return may far outweigh the expenditure required. The failure to maintain proper development facilities may eventually be a question of future existence as well as present profit.

In many respects the modern chemical engineering laboratories of many educational institutions, although operated primarily for purposes of instruction, are essentially similar in equipment and operation to the industrial semi-plant laboratory. In the former emphasis is placed usually on fundamental principles involved in chemical manufacturing operations rather than on study of a special chemical process or product. The problems encountered are, however, not greatly dissimilar to those of the industrial semi-plant. Flexibility in operation, adaptability and suitability to a broad variety of uses, and the ability to yield accurate quantitative engineering data, all for a minimum first cost and operating expense, are primary considerations for the equipment of the ordinary university laboratory as well as the industrial semi-plant. It is the belief of the writer that much of the equipment, methods, and experience developed in the university chemical engineering laboratory may be directly and profitably adapted to that of the industrial plant. The material of the present article is largely based upon experience and information acquired in connection with the design and operation of a university semi-plant laboratory and a certain amount of industrial development work. Although much will undoubtedly be familiar to those chemical executives and engineers concerned particularly with the research



Courtesy "The Chemist"
*Figure 2—Unit process equipment in chemical engineering laboratory.*

and process development fields, it is hoped that the present discussion may not be without interest in some directions.

### Purpose and Use

The first important use of a semi-plant laboratory is the study of new processes to secure adequate technical and engineering data for the design, operation, and control of the full-size plant and equipment. At this stage, process, reactions and materials may be adequately studied on a scale sufficiently small to insure wide flexibility in operation, but yet sufficiently large to yield results of significance to the design and operation of the commercial plant. For the first time the actual chemical engineering equipment required by the process can be ascertained, and possible needs in the way of special construction materials will become evident. A preliminary cost estimate made in the semi-plant will supply an insight into the economic feasibility of the process as proposed. The expenditures for equipment, materials, and labor required for determining operating details, investigating yields and quality of product, developing methods of control, and designing proper equipment will in the semi-plant be very small compared to those necessary after the process is in large scale operation.

A second important function of the semi-plant is the study of existing processes, equipment and operating methods with a view to establishing sources of trouble and methods for their elimination, or to improving yields, quality of product or design of equipment. Another use will often be the study of methods for the utilization of new products, new uses for old products, and methods of utilizing by-products. Finally, the semi-plant may be used for the manufacture of special or new products for which the demand does not justify a large plant.

The relative emphasis placed upon the above uses will depend upon the individual organization and will vary from period to period within the same organization. It is important, therefore, that the semi-plant be sufficiently flexible in equipment and operation to permit its adaptation to immediate demands. The ultimate success of a commercial scale process may depend largely upon the facilities and skill available for the semi-plant stage operation as well as the interpretation of the results obtained. In turn these may largely depend upon the nature of the semi-plant laboratory and equipment.

In a specific case it is to be expected that the detailed character of the semi-plant laboratory and equipment will be governed by the nature of the organization concerned, its existing or potential plant, processes and products, as the problems it will be called upon to handle will ordinarily be peculiar to these. Not infrequently economic requirements will be dominant. The present article is concerned with general requirements, principles, and methods applicable to the semi-plant in general rather than with specific applications.

In most of the chemical engineering laboratories of educational institutions attention is focused as regards both equipment and operation on the individual chemical engineering operations and chemical unit processes involved in a given manufacturing process rather than on the process as a whole. The industrial semi-plant laboratory will yield the most successful results if operated from the same point of view, except in very special cases. It is ordinarily neither feasible nor necessary to connect an entire system of operations into the process as a whole at the semi-plant stage.

Scale of operation and equipment capacity create the first problem in the selection of semi-plant equipment. Since these vary with the operation, process and product, no definite answer to this question can be given here. The scale of operation must be sufficiently large to yield data and information indicative of full scale operation, and a quantity of product sufficient for measurement and study should be produced. On the other hand ease and flexibility of operation, accuracy of measurement, and control are usually sacrificed, and the costs of raw materials, equipment, labor and operation increased as the scale of operation is enlarged. Selection of a preferred semi-plant operating scale requires an intelligent balancing of these factors for the individual process.

### Minimum of Suitable Equipment

The primary requirement for the semi-plant laboratory is the provision of a minimum of suitable equipment for the performance of the generally important operations basic to all chemical manufacturing processes. Preferably the units provided should be representative standard types of chemical engineering equipment covering the broadest possible field of service. These may be supplemented with such special equipment as the specific needs of the individual concern demand. In all cases careful attention should be paid to selection, design and installation to insure flexibility of operation, maximum adaptability, and ease and accuracy of control and measurement of quantities and variables. It is obviously not feasible, nor is it necessary, to provide a multiplicity of equipment types for each operation. Unless a problem involves study of a particular type of equipment, a comparatively small number of properly selected and designed standard type units in which basic operations may be studied and performed may ordinarily be so adapted as to permit the successful handling of a large proportion of development problems.

Although the standard equipment available for the performance of the process in the semi-plant may not be strictly comparable to that which the full scale plant will ultimately employ, thus not permitting direct application of the semi-plant data, this may frequently be so interpreted and applied to the design

of the full scale unit as to render use of semi-plant equipment of this exact type unnecessary. Frequently in conjunction with projects demanding special units or construction materials at some stage, the standard equipment already available may be advantageously employed for some other phase of the process. The particular character of the parent organization or the general type of work foreseen for the semi-plant will supply a basis upon which a choice between various types of equipment and methods of performing a given operation may be made.

### Materials for Basic Equipment

The common and least expensive construction materials such as cast iron, steel, copper or wood, will usually permit a sufficiently varied use for the basic equipment. In some cases, however, use of an inexpensive alloy or other corrosion-resisting material may sufficiently broaden the application or lengthen the life of a piece of equipment so as to overbalance its greater initial cost. Need for equipment constructed of special materials will in any case be met as occasion demands.

From time to time new projects requiring semi-plant equipment of special design will arise, and this will necessarily be procured as the need develops. It is of prime importance that adequate provision for its installation, operation and sometimes construction be available in the semi-plant. It is advisable to consider its possible future adaptation to uses other than that at hand and to govern its selection as far as possible by its future utility as well as immediate use. It may frequently be advisable at the time of purchase to provide minor features broadening its field of service though these are not required for the purpose at hand. Preliminary investigation with standard equipment already available will in many cases permit the rational design and construction of such special equipment.

The question frequently arises as to how far it is necessary to go in the effort to duplicate the actual large scale chemical manufacturing process and equipment in the semi-plant. Extremely simple and crude devices may be employed for the performance of a given operation on the small semi-plant scale in cases where it is certain that similar methods and equipment will not be utilized for the commercial plant. Simplicity of equipment and operation is highly desirable in the semi-plant, especially since it leads to reduced costs, but at the same time, if pushed to extremes, may well defeat the purpose of the semi-plant study in that the data obtained may be without real significance for the full scale plant. Semi-plant apparatus and methods should resemble to the greatest extent feasible those which can be foreseen in the final plant process. Makeshift methods and equipment are justifiable only in cases where the semi-plant study has for its sole purpose observation of the properties of materials involved in the process and the obtaining of supplies of intermediate and final products for examination. Then the question as to whether this may not be accomplished more satisfactorily with less time and labor on a true laboratory scale should be considered. Thus, by way of illustration, filtration on the semi-plant scale may be accomplished with the crudest sort of box filter. This operation almost invariably should be carried out in the semi-plant with a small filter press, vacuum filter, or similar chemical engineering unit and that such equipment should be available in the semi-plant for this operation. Only in this way can the effect of operating conditions be adequately judged in the ordinary case and the data obtained applied with confidence to the selection of the full scale equipment. Though it may on occasion be desirable, it is by no means necessary, however, to study the filtration operation in all possible types of filtration equipment.

The housing of the semi-plant laboratory depends so largely upon specific conditions that only a very few generalizations are possible. A one story structure or room the equivalent of two ordinary floors in height over the entire floor is preferable. Balconies along one or more sides and provision for the erection of temporary operating platforms are desirable. It is advisable to provide a number of smaller rooms for certain types of work. Concrete floors are usually most satisfactory. Adequate and convenient drainage facilities are an important feature sometimes neglected. Service outlets for water, electricity, steam, and sometimes gas, should be located at a number of strategic points. A small travelling crane conveniently arranged over the main laboratory floor space will be a valuable aid to the transfer and handling of heavy equipment, containers and material. Non-portable units should be installed for flexibility in subsequent arrangement, ease of operation, control and measurement. Individual motor drives for pumps, agitators and other units requiring power, although necessitating larger initial outlay will make for greater ease and economy of operation.

### Semi-Plant Equipment

The nucleus of the semi-plant equipment will commonly be that for performing and investigating the most frequently encountered operations of filtration, distillation, evaporation, and drying. Supplementing this and varying with the individual case small scale equipment for conducting such operations as grinding and screening; tanks and kettles for mixing, dissolving, and precipitation; crystallizing kettles or pans; some type of furnace for roasting and fusion; small units for conducting such chemical unit processes as nitration, sulfonation, and fusion; autoclaves, and others, will be provided. In most cases one or possibly two small kettles properly designed may be made to serve for all of the last named series of operations in the semi-plant, and may be obtained

from equipment manufacturers. In other cases still more highly specialized equipment, such as hydraulic presses, differential plastic rolls, heavy-duty mixers, colloid mills, paint mills, centrifugals, glass-lined or enamel equipment, and others, may be required in the semi-plant for general use. Much equipment of a special nature will necessarily be designed and constructed for particular jobs, as, for example, the study or investigation of a catalytic gas reaction or a process involving adsorption.

For a number of operations small size units of standardized design which are readily adapted to semi-plant problems may be obtained from equipment manufacturers. In other cases it will be advisable or sometimes necessary to design the unit specially for semi-plant purposes, but along standard lines, and have it fabricated by manufacturers of such equipment. Apparatus for many semi-plant purposes may be satisfactorily constructed immediately in the semi-plant from readily available and inexpensive materials and parts.

### Semi-Plant Filtration Problems

Most semi-plant filtration problems can be successfully and conveniently handled with a 10 or 12 inch plate and frame filter press provided with 2 to 10 plates and frames. Supplementary to this a small single-leaf vacuum leaf filter and tank of the Moore type is a useful device for many semi-plant filtration problems. Such equipment will serve satisfactorily and conveniently not only for performing a given filtration but also for determining filtering characteristics of sludges, rates of filtration, effect of operating conditions, and for the prediction of capacity, size, and type of the full-size equipment. Semi-plant filtration equipment of other types, such as the Kelly and Sweetland filters or the rotary vacuum filter may be purchased or rented where desired for particular problems. Cast iron filter press construction will usually prove least expensive and sufficiently serviceable. The field of service and life of the unit may be increased by use of an inexpensive corrosion-resisting material, however, to an extent justifying higher initial cost, especially since corrosion attending intermittent use in the semi-plant is severe. It is advisable and convenient to provide a press with means for thorough washing and both closed and open delivery, and mounted together with a small and rugged rotary or centrifugal sludge pump, valves, and connecting piping on a movable stand. This adds little to the cost. Such units may be obtained from manufacturers at relatively low cost. Pump bearings and impellers if made of a corrosion-resisting material will be less likely to cause trouble due to corrosion and consequent freezing of the pump.

Semi-plant evaporative equipment may be of a wide variety of types and kinds of open and closed jacketed kettles, pans, or vats of varying degrees of crudity. While equipment of this general type may furnish a means for getting a given solution evaporated, it will not in the majority of cases supply data of significance for the full size evaporative equipment and operation. It is advisable and profitable to provide a small tubular vacuum evaporator of standard design for handling evaporative problems in the average semi-plant. While the data obtained with it may not be directly applicable to the large scale evaporative equipment, it will certainly serve as a guide. Furthermore, the usefulness and general efficiency of such a unit for semi-plant evaporation will fully justify its cost.

### Solving Semi-Plant Operative Problems

The writer has had in operation under his supervision for several years a small tubular, double-effect, evaporator of approximately 500 pounds of water per hour capacity which has proved exceedingly useful for semi-plant evaporative problems. The bodies are of cast iron construction, 2 feet in diameter by 8 feet high, one being of the horizontal tube type, the other vertical tube. The heating surface is about 14 square feet, the tubes being of copper. They are mounted on an I-beam stand and so piped that either may be operated as a single or both together as a double. The vertical tube body is provided with a salt box for crystallizing solutions. The unit is equipped with a surface condenser, entrainment separators, tanks for measuring condensate, level glasses, sight glasses, pressure and vacuum gauges, orifice meters for feed and cooling water, and other accessories permitting not only the performance of a given evaporation but the securing of any data desired. This unit has been adapted to a number of problems, being extremely flexible in operation. It was especially designed and fabricated, and may be seen in Figures 1 and 2.

Of the many varieties of drying equipment the shelf air and vacuum driers will prove most useful for and adaptable to semi-plant drying work and should be provided for general drying service. These need not be of elaborate construction, but must be correctly designed to secure accurate drying results; should permit operation under a variety of air velocities, temperatures, humidities, and arrangements of drying stock; and should provide means for accurate measurement of all drying variables. Semi-plant vacuum driers may be obtained from equipment manufacturers. For the small drying capacities generally required for semi-plant studies, it will usually prove advisable and less expensive to design the air drier specially. Greater flexibility in operation and measurement at less expense will result. A small drier designed with the points mentioned above in mind has been in operation under the writer's supervision with satisfactory results. It may be seen at the right of Figure 1. Heat balances and heat requirements obtained with the small semi-plant drier are not directly indicative of those to be expected with the large plant unit. While they may serve as a basis for its design, they should be applied with great caution.

The small drier may, however, supply satisfactory data on drying rates and characteristics of various materials, and the proper drying temperatures, humidities, and air velocities to employ. Drying equipment such as the rotary drier, drum, or spray drier will usually find a place in the semi-plant only for special drying problems. A vacuum pan drier, provided with agitator, may sometimes be of considerable use.

For simple distillation in the semi-plant a small closed kettle or pan provided with jacket or closed steam coils and a small tubular or coil condenser will serve. A 6 to 10 inch fractionating column of either the packed or bubble-cap plate type should be available for fractional distillation. The packed column is less expensive and is readily constructed in the plant from materials ordinarily available. However, the writer is inclined to regard the bubble-cap plate column as a more efficient and generally useful fractionating device for the average semi-plant distillation, and if not indispensable, at least the preferable unit, particularly in view of the likelihood that it will be the type utilized for the plant operation. Besides being generally adaptable and efficient, it is more likely to yield significant engineering data directly applicable to the plant equipment. In special cases where corrosive materials are to be handled the packed column may be justified. A single well designed still and plate column set-up may be made to serve for the ordinary run of semi-plant distillations and to yield data directly applicable to the full-size equipment and operation. Such a unit is in operation under my supervision, and may be seen in Figure 2. This consists of a 40 gallon jacketed kettle still, a 15 plate, bubble-cap column (two caps per plate), 8 inches in diameter, and two tubular condensers, the first of which may serve either as a dephlegmator or as a total condenser. The unit is of copper construction and has an average capacity of 10 to 20 gallons per hour. Column, still, and condensers are independent and so arranged that the column may be by-passed for cases where fractionation is not required. The still is provided with thermometers in liquor and vapor spaces, level gauge, sight glass, hand hole, feed inlets, and perforated steam coils for steam distillation. The column is provided with draw-off valves and tubing for sampling the liquor on each plate, thermometers at several points, means for steam injection at the base of the column, and feed inlets on three center plates, for continuous distillation. Reflux is supplied either by dividing the totally condensed product or by partial condensation. Small "Rotameters" in reflux and product lines have been found convenient for measuring flows. Vapor temperatures may be taken at various points and the flow and temperatures of condenser water measured. Vacuum receivers are provided for vacuum distillations. Besides serving satisfactorily for effecting given fractionations and for small scale production, this unit permits the determination of plate requirements, reflux ratios, plate efficiencies, heat requirements, proper feed point location for continuous distillation, separation and recovery. This data may be applied with confidence to the full scale equipment.

Besides major equipment it is equally important that adequate accessory equipment permitting its operation be available. Suitable and accurate measuring and metering instruments and equipment are even more important, although elaborate and expensive recording instruments are not ordinarily justified except for special problems. Shop facilities where alterations and repairs can be made and simpler new equipment constructed are indispensable for the average semi-plant. Even where a large shop is maintained by the plant a small shop immediately adjacent to the semi-plant and scantily equipped with lathe, drill, forge, welding and cutting outfit, hand and pipe tools, will sufficiently facilitate the set-up of equipment and conserve time and expense to justify its existence.

### Accessory Equipment

Accessory equipment will include various pumps, solution, storage, and measuring tanks, condensing equipment, and others. Small portable centrifugal and gear pumps are most useful. Oil pumps from junked automobiles have been found useful for small flows and of negligible cost. Portable direct motor driven stirrers will serve for most agitation problems. Supplies such as pipe and fittings, valves, packing and gaskets, etc., form an appreciable item of expense which should not be overlooked.

Measuring instruments include those for temperature, pressure, vacuum, humidities, densities, weighing, and flow. Temperatures are conveniently and accurately measured with thermocouples and an inexpensive, portable, industrial type potentiometer. They may be readily made as needed from a supply of ordinary insulated and calibrated thermocouple lead wire. Thermocouples avoid excessive thermometer breakage and permit the temperature to be read at a distance from the source. Simple and rugged differential manometers and orifice meters may be readily constructed in the semi-plant.

It may be argued that the results of semi-plant experimentation with small scale equipment cannot be applied directly to the full scale plant; therefore, that the crudest and least expensive sort of equipment and operation at this stage is satisfactory. While this is true in some cases, neverthless, the expense incurred in pursuing the semi-plant study in actual chemical engineering equipment resembling so far as feasible the large unit, and in having well designed and flexible semi-plant units of broad utility available for this purpose, will usually be more than justified by results. In no case, however, will semi-plant experimentation dispense with the necessity for engineering skill, intelligence, and judgment in applying the results to the actual chemical plant operation.

# Problems of Industrial Taxation

By Walter A. Staub

Lybrand, Ross Bros. & Montgomery

OUR total tax burden, federal, state and local, is estimated in excess of ten billion dollars per annum. Our annual national income is estimated at almost eighty billions for the best year prior to the depression but as having since fallen to almost one-half that figure. Roughly speaking, our tax burden is one-fourth of the national income.

About a year ago the House Committee on Ways and Means submitted a preliminary report on taxation containing much useful data. This report indicates that in 1931 the country's total tax bill amounted to slightly over nine and one-half billion dollars, of which federal taxes accounted for some two billion four hundred thousand, or 25 per cent. The balance of seven billion one hundred thousand, or 75 per cent., represented state and local taxes. It is apparent, therefore, that the tax problem is not merely, or even primarily, a problem of federal taxation. City taxes alone comprised 31 per cent. of the total. The total tax burden for the year 1931 was estimated at $77.53 for each man, woman and child in our country, and $3.98 for every $100 of taxable wealth in the country.

Referring specifically to industrial taxation, for the year 1931 corporations which earned net income paid out over 23 per cent. of their net income in taxes. Transportation companies and public utilities paid out over 27 per cent.; agriculture and related industries paid over 36 per cent. It must not be assumed that taxes paid by corporations are paid only by the wealthy. It is estimated that the corporations of our country are owned by many thousands of individual stockholders, and it is these stockholders and the customers of the corporations who really pay the corporation taxes. A small stockholder may pay directly only four per cent. of his income in federal income tax, but to the extent that his income is derived from corporate dividends he has paid indirectly an average of over 20 per cent. of his income in various taxes, in addition to the taxes which he paid directly.

Any tax system designed to raise some ten billion dollars annually, especially with our greatly reduced national income, must choose between various evils rather than impose taxes which may be readily borne by industry. Granting that the only permanent solution is a reduction of expenditure, the country nevertheless faces the problem of raising a tremendous amount of revenue. The problem is to distribute this burden as equitably as possible. One hundred and fifty years ago the fundamental principles which should govern taxation were stated by Adam Smith. These principles have been summarized by Professor Munro, of Harvard University, as follows:

> People should be taxed as nearly as possible in proportion to their respective abilities; all taxes should be definite and not uncertain or arbitrary; they ought to be levied at the time and in the manner which causes the least inconvenience to the people; and they should be so contrived as to take out of the pockets of the people as little as possible over what is needed by the Public Treasury.

In practice several, if not all, of these principles are continuously violated.

The greatest single tax burden is the general property tax, which in 1931 represented over 53 per cent. of all taxes collected. This tax continues to be the mainstay of local governments. Whereas the federal and state governments have to some extent shifted the tax burden between various sources, the local governments have continued to derive more and more of their revenues from property taxes. For example, during the decade ending with 1931, when the population of the country as a whole increased less than one-fourth, the total amount of general property taxes levied in cities of over 30,000 inhabitants more than doubled. This condition is resulting in an even heavier burden on manufacturing concerns located in the cities, and to some extent the high rates prevailing in metropolitan centers have already impelled some concerns to move to communities with lower taxes. This tendency may become much more marked in the next decade, if the burden of the general property tax is not lightened through greater economy in municipal expenditure.

There is a distinct trend toward general sales taxes. At present, such taxes are in force in a number of states, and under consideration in others. There are strong arguments against the sales tax. It is not based upon ability to pay, it weighs relatively more heavily upon the poor than upon the rich, adds to the price of merchandise and tends to retard sales at a time when industry faces the problem of producing goods at prices at which they can be absorbed with the present reduced purchasing power of the country. The chief argument in its favor is that it is a comparatively easy method of raising revenue, and that it has more assured productivity in a time of reduced incomes than other taxes, such as the income tax, which may in principle be preferred as more nearly meeting the standard of proportionate ability to pay. When food and clothing are exempted from the sales tax, much

objection to the tax is removed, though on the other hand its productivity is also considerably lessened.

State sales taxes do not work fairly because of limitations on the taxing power of the states contained in the federal constitution, and because of lack of uniformity between such taxes imposed by adjoining states. Sales of merchandise to be shipped from one state to another cannot be subjected to a state sales tax. There is accordingly a strong inducement to buy in another state or from a mail order house, to the disadvantage of the local merchant.

If we must have sales taxes, it would be fairer to have them levied by the federal government and returned in part to the states. The federal government now levies manufacturers' sales taxes on about 35 types of merchandise. Manufacturers of these types of merchandise have complained with justice that they are being discriminated against. A general sales tax by the federal government would at least end these inequities, though, as previously stated, any sales tax is open to strong objections on general principles.

#### State Franchise Taxes Should Be Improved

There is considerable room for improvement in state franchise taxes levied on corporations for the privilege of exercising their charters or doing business within the state. Corporations doing a national business must file franchise tax returns in numerous states. There is no uniformity in the franchise tax laws of the various states and even when the rates of tax are not excessive the diversification in the state laws, the ambiguity of some laws, the variations in the forms of the reports that must be filed, and the information that must be furnished place these taxes very close to the nuisance category. It would be a distinct benefit if states would cooperate for the enactment of uniform franchise tax laws and the requirement of uniform reports as far as this may be feasible, especially with respect to the allocation of income among states, in the case of corporations doing business in, and subject to taxation in, more than one state.

There is scarcely any tax levied by the federal government that is not also levied by one or more of the states. It has been estimated that there are over thirty subjects of taxation by the federal government which are also taxed by one or more states and territories. With mounting expenditures and the continuous search for new sources of revenue, these duplications are increasing from year to year. It stands to reason that, if the federal government takes a portion of the revenue from some source and the states or their subdivisions take still more, the source may well dry up or evasions be encouraged. For example, the combined federal, state and even local taxes on gasoline have at times been equal in some places to almost 100 per cent. of the selling price of the gasoline itself. This is obviously a case of duplicate taxation run riot or of riding a good horse to death. One hears rumors of "bootleg" gasoline which is supposed to have escaped paying the tax.

It seems important that careful studies should be made of the types of taxes that may best be collected by the federal, state and local governments, respectively, and that measures should be taken to eliminate the numerous duplications that now exist. To some extent the states now collect taxes and return a portion of them to the communities from which they were collected. This principle might be more widely adopted and might well be extended to the interrelation of the federal and state governments.

It might be argued that it would make little difference to a New York corporation whether it pays four and one-half per cent. of its income to New York State and 13¾ per cent. to the federal government, or whether it pays 18¼ per cent. to the federal government. However, when the federal government fixed a corporation income tax rate of 13¾ per cent., it was not concerned with the fact that a business corporation in New York State pays four and one-half per cent. of its income to the state government. If all taxes on corporate income were levied by the federal government, to be returned in part to the states, it is entirely probable that the federal rate would have been less than 18¼ per cent. Under such a plan New York State would receive some benefit from the fact that it pays such a large proportion of the income tax collected by the federal government.

#### International Taxation

As for duplications in international taxation, the House Ways and Means Committee is to propose a measure which, if adopted, would be a distinctly backward step. For years the International Chamber of Commerce and the League of Nations have been working through committees to minimize double taxation. This country has taken a leading part in this work. In our own federal income tax laws we have done much to relieve American industry of this burden. Since 1918 our income tax laws have provided that an American corporation doing business in a foreign country may credit against its United States income tax the income taxes which it is required to pay to foreign countries, with suitable restrictions to prevent it from paying to the United States less than the full tax on all income derived in this country. This credit was allowed on the theory that each country should receive the tax on the income derived from that country, and that a corporation could not be expected to pay income taxes to more than one country on the same income. For example, a United States corporation doing business in Great Britain is required to pay a British tax of 25 per cent. of its income. Under our present income tax law such corporation would pay no tax to the United States on its British income.

The House Ways and Means sub-committee recommended that the credit for foreign taxes be eliminated

entirely, and that corporations doing business in foreign countries be obliged to pay 13¾ per cent. tax on all income derived from foreign countries. The Secretary of the Treasury opposed this recommendation and urged that the credit be retained. According to newspaper reports, the Ways and Means Committee decided as a compromise to recommend that the credit for foreign taxes be reduced by one-half, or, in other words, that a corporation pay one-half of the United States tax on all income derived from a foreign country in addition to the income taxes paid to such foreign country.

Anyone familiar with the foreign operations of our industries knows the tremendous difficulties that have been encountered, particularly during the past few years. At this time when our foreign trade needs every bit of encouragement that can be given to it, it seems singularly inappropriate to add this additional burden. It would seem proper for taxpayers to exercise their constitutional right of petition, and to communicate with their Congressional representatives with a view to eliminating this serious inequity.

Probably the most glaring instance of double taxation confronts an American corporation doing business in France through a French subsidiary. The French subsidiary must pay a tax to France on its earnings. When the French subsidiary pays its earnings as dividends to the American parent company, it must pay a further tax to the French government. The French government claims still further that, when the American parent company pays a dividend to its own stockholders, a French tax must again be paid on this dividend to the extent that it includes earnings of the French subsidiary. According to newspaper reports, in order to meet discrimination of this kind, the Ways and Means Committee is to recommend the authorization of discriminatory taxation against foreign corporations domiciled in countries which discriminate against our corporations.

The wisdom of such legislation is questionable. Retaliatory measures merely breed further retaliations. It is doubtful whether by treating foreign corporations unfairly we can improve the treatment of our corporations by foreign countries. Decidedly so it is more preferable to see all foreign corporations fairly treated and trust to the usual diplomatic channels for the elimination of inequities.

In connection with the pending new Revenue Act much has been said regarding tax avoidance, and it has been proposed to raise over two hundred million dollars in additional revenue through stopping up loopholes in the income tax law. There are undoubtedly some loopholes which should and will be eliminated. However, there is grave danger that, in its anxiety to prevent tax avoidance, Congress will enact provisions unfair to taxpayers. Reference has already been made to the proposed reduction in the credit for foreign taxes.

Another unfair proposal of the Ways and Means Committee is to increase to 15¾ per cent. the income tax rate on a group of affiliated corporations electing to file a consolidated return. The income tax rate on separate returns is 13¾ per cent. Under existing law if a consolidated return is filed for 1933 the rate is 14½ per cent. and for 1934 and 1935 the rate is 14¾ per cent.

It is difficult to see any justification for a two per cent. additional tax on consolidated returns. Consolidated returns were first required in 1917 in order to prevent tax avoidance rather than to permit it. Consolidated financial statements were developed years before the imposition of our first federal corporation income tax in 1909 in order to show the true financial position and results of operations of a group of corporations under one ownership. Similarly, it is only by means of a consolidated tax return that the true taxable income of a group of affiliated corporations can be determined. Why should a group of corporations be penalized to the extent of two per cent. for determining their taxable income according to sound accounting principles?

Our federal income tax law already contains inequitable provisions regarding capital losses and it is proposed to increase, rather than to eliminate, these inequities. Under existing law if a corporation sells securities at a loss it can deduct the loss from its operating income only if the securities have been held for more than two years. It is now proposed to prohibit the deduction of any net loss on securities sold, regardless of how long the securities have been held. However, if securities are sold at a net profit, such profit will be taxable. If the sale of securities at a profit increases the capacity to pay taxes, it seems obvious that the sale of securities at a loss must correspondingly reduce the capacity to pay taxes. I know of no theory which would justify the taxing of net gains, while prohibiting the deduction of net losses. As for the avoidance of taxes by selling securities at a loss, it is hard to understand how any sane taxpayer would deliberately lose money in security transactions in order to recover in taxes 13¾ per cent. of his loss.

In conclusion, Congress and our state legislatures, as well as our local governments, have a tremendous task in attempting to restrict and reduce public expenditures and to distribute fairly the necessary tax burden. The difficulties are not to be minimized. Industry will assume its full share of the burden, but it is entitled to have the assurance that this burden has been (again quoting Doctor Munro's paraphrasing of the principle enunciated by Adam Smith) "So contrived as to take out of the pockets of the people as little as possible over what is needed by the Public Treasury," and to have the further assurance that the tax burden has been spread as equitably as is humanly possible.

# CHEMICAL

## The Photographic Record

*Associates of Charles Hardy, president, Charles Hardy, Inc., insisted that he needed a rest. After much persuasion he finally agreed to a trip through the Mediterranean countries. By boat, plane, camel, and car he and Mrs. Hardy explored the tombs at Luxor, the mysteries of the Nile, etc. Mr. Hardy's companions are—above, a dragoman (guide) and left, a snake charmer.*


*Why shouldn't he smile? His plant has been operating less than four months at 101% of projected capacity. G. F. Dressel, manager new Dow bromine plant at Wilmington, Del.*

*Lower and opposite page photograph. A new attendance record (1,200) was set at the ninth annual dinner of the Drug, Chemical and Allied Trades Section, New York Board of Trade, held in the Waldorf-Astoria, on March 9th. The Hon. James A. Farley, Postmaster-General was the principal speaker.*

# NEWS REEL

## of Our Chemical Activities

*New Southern office of "Chew, Chew and Chew". John A. Chew buys "Ellwood" at Berryville, Virginia, former Gold Estate. House built in 1814 by one Thomas Gold. Chemists' Club "Percolator" in reporting purchase suggested that it was a swell place "to starve in" but John says it is the result of treating his customers right.*

*Robert I. Wishnick, president of Wishnick-Tumpeer, Inc., and Mrs. Wishnick, snapped at Cannes, on the Riviera, where they vacationed after a business trip through Europe.*

# Chemical Consumption

*A digest of new products and processes in process industries for the user of chemicals.*

## Satin White

**By Edwin Sutermeister**
**Chief Chemist, S. D. Warren Company**

The question of what satin white is chemically has always been quite a mystery. It was formerly supposed to be a mixture of calcium sulfate and aluminum hydrate formed according to the reaction:

$$3Ca(OH)_2+Al_2(SO_4)3=3CaSO_4+Al_2(OH)_6$$

This idea will be found stated in the literature at least as late as 1925.[1] Bunce,[2] in 1927 speaks of satin white as containing calcium sulfate, aluminum hydrate and calcium hydroxide, but as early as 1920 Cobenzyl gave reasons for believing that it consisted of calcium aluminate and gypsum $Ca_3Al_2O_6 + 3CaSO_4.2H_2O$. This theory of Cobenzyl's was apparently also that of Fuchs,[3] who carried out investigations on the nature of the reaction and concluded that Cobenzyl's formula was correct except for the addition of small amounts of calcium hydroxide. The most recent theory is that of Meyer,[4] based on a publication of the Bureau of Standards,[5] who believes that satin white is calcium sulfoaluminate—$3CaO.Al_2O_3.3CaSO_4.31\ H_2O$.

There are many reasons for thinking that most of the early formulas are not representative of satin white. If it consists of a mixture of $CaSO_4.2H_2O$ and $Al(OH)_3$, it should show practically no alkalinity, while most satin whites contain a very considerable amount of alkaline material which may be titrated with standard acid using phenolphthalein as an indicator. This formula also calls for a loss of moisture at 100° C. of only about 20 per cent. of its air dry weight, while satin white actually loses about 28 per cent. at that temperature. Furthermore, if the temperature were raised to 140° C., experiments show that the mixture called for by the formula would lose a total of only 20.6 per cent. of its air dry weight, while satin white loses about 31 per cent. It is very evident that this formula does not fit the facts, but if further confirmation is necessary it will be obtained by the microscope which shows the absence of gypsum crystals.

The supposition that satin white is a mixture of calcium sulfate, aluminum hydrate and calcium hydroxide is also negatived by considerations of the moisture lost on drying. Also, experiments have proved that such a mixture made from the individual materials behaves very differently from satin white in a coating mixture. Finally it does not act as a solvent for casein, which it should do if it contained as much calcium hydroxide as the titratable alkalinity calls for. It would appear that this formula is definitely out on all counts.

Considering Cobenzyl's formula as $Ca_3Al_2O_6.6H_2O + 3CaSO_4.2H_2O$, the total moisture which might be lost on drying at 140°C., or even on ignition, would be 24.1 per cent. while air dry satin white loses about 31 per cent. at 140° and 45.1 per cent. on igniting. It seems quite certain that Cobenzyl's formula is also incorrect and again the absence of gypsum crystals confirms it. This formula is, however, the first one which could explain the fact that on dialysis a large proportion of the alumina passes through parchment paper.

Many of these criticisms are based on the moisture content of air dried satin white so a few words should be said in regard to the drying of satin white. This is a progressive change and the loss increases up to a temperature of 140° C. at least and on ignition over a Meker burner there is a still further loss in weight. There is some question whether this loss on ignition is all moisture or whether some $SO_3$ is also driven off. It is known that part of the $SO_3$ is driven off from $CaSO_4$ at this temperature, but until experiments are conducted on the pure material composing the major portion of satin white, it will not be known whether it suffers a similar loss. The loss in weight of four different samples of satin white at different temperatures is given in the following table. All are based on the material dried to constant weight in the open air at 25° C.

| *Sample No.* | *Per cent. loss in weight at* 50° | 100° | 125° | 145° | *Ignition* |
|---|---|---|---|---|---|
| 1 | 1.16 | 25.25 | 27.80 | 28.87 | 39.98 |
| 2 | 1.15 | 28.05 | 30.42 | 31.67 | 43.13 |
| 3 | 1.45 | 30.70 | 33.05 | 34.23 | 47.48 |
| 4 | 1.08 | 27.51 | 29.35 | 30.84 | 50.88 |
| Average | 1.21 | 27.88 | 30.16 | 31.40 | 45.37 |

As compared with these figures, if the water of crystallization only is driven off by the ignition of calcium sulfoaluminate $3CaO.Al_2O_3.3CaSO_4.31\ H_2O$ the loss in weight would amount to 45.6 per cent. of its weight. There must surely be some significance in the close agreement of this figure with the average loss on ignition of the four samples tabulated and it would seem to indicate that no loss of $SO_3$ occurs on ignition.

In criticizing the early formulas, it has been noted that they do not allow for any alkalinity in the product, although it is actually very strongly alkaline to phenolphthalein. There are several ways of looking at this question of alkalinity and numerous methods proposed for determining it. Some consider the alkalinity as the entire amount directly titratable by acid, while others divide it into alkalinity due to the satin white proper and that due to free lime which has not combined with the alum. Dreshfield[6] has proposed a method for the determination of excess lime which depends on treating the satin white with

sugar solution, filtering and washing under definitely controlled conditions, and titrating the alkaline filtrate and washings. If this treatment is repeated several times on the same sample, alkali will be removed each time, indicating that the results do not depend on the total removal of a small and definite amount of calcium hydroxide but rather on the solubility of the satin white itself in sugar solution of the strength used. The presence of alumina in the solution after titration affords further evidence that the substance being titrated is not calcium hydroxide but an alkaline substance containing alumina which is set free when the basic portion of the compound is neutralized by the acid.

Another method used for determining the alkalinity of satin white is direct titration with standard acid using phenolphthalein as the indicator. This method will give the total alkalinity of the product and will include that of the satin white molecule itself as well as any actually present as calcium hydroxide. This method can be used to determine the uncombined calcium hydroxide only if a complete analysis of the sample is made and if it is assumed that satin white is some definite compound. It is, however, a useful control test in making satin white, although it is interesting to note that among commercial samples tested the one which gave the highest alkalinity by titration was claimed by its makers to have the least free lime. So far it has not proved possible to reconcile these two statements.

If this direct titration method is used commercial satin whites show alkalinities of around 17.7 to 18.5 per cent. expressed as $Ca(OH)_2$ and based on the air dry satin white. The alkalinity of the calcium sulfoaluminate molecule would be 17.8 per cent. on the same basis. Here is more evidence indicating that satin white is essentially calcium sulfoaluminate.

If this is true, it would be expected that carbon dioxide would break down the molecule by combining with the CaO and setting free the $Al_2O_3$ in the hydrated form and the calcium sulfate as gypsum. This is found to be the case, for if $CO_2$ is passed into a suspension of satin white in water gypsum crystals can be readily detected under the microscope, together with structural material which is probably aluminum hydrate. The original crystalline form is completely changed and calcium carbonate can be detected by evolution of $CO_2$ by treating with acid. This reaction with carbon dioxide should set free a large proportion of the water of crystallization of the calcium sulfoaluminate according to the equation $3CaO.Al_2O_3.3CaSO_4.31\ H_2O + 3CO_3 = 3CaCO_3 + 2Al(OH)_3 + 3CaSO_4.2H_2O + 22\ H_2O$.

According to this, the loss due to carbonation and air drying should be 21.2 per cent. of the original air dry weight and from two tests on different satin whites the figures found were 19.4 and 25.4 per cent. respectively. Considering the differences in the two products used and the impossibility of air drying satin white without the absorption of some $CO_2$ these are considered as reasonable checks with the theoretical and as strengthening the evidence that the reaction takes place as given above.

Meyer finds that a similar reaction takes place when satin white is treated with soda ash:

$$3CaO.Al_2O_3.3CaSO_4.31\ H_2O + 3Na_2CO_3 = 3CaCO_3 + 6NaOH + Al_2O_3 + 3CaSO_4.2H_2O + 22\ H_2O.$$

This reaction may have some bearing on the action of coating mixtures where soda ash is used as a solvent for casein which is to be used in the presence of satin white.

Mention has been made of the presence of alumina in the solution obtained by dialysis of satin white. One such test showed the presence of 86.2 per cent. of the $Al_2O_3$ and 87.6 per cent. of the CaO present in the sample taken for the test. This dialysis was admittedly somewhat crude as it was impossible to prevent completely the action of $CO_2$ on the sample and there may have been some slight action on the glass vessels due to the very long time necessary to reach a point of neutrality to phenolphthalein. Even under such conditions the results are considered to have an important bearing on the constitution of satin white as they could not have been obtained if the aluminum had been present as $Al(OH)_3$.

In the present state of our knowledge and considering the evidence here presented, it seems most likely that satin white is calcium sulfoaluminate with the formula $3CaO.Al_2O_3.3CaSO_4.31\ H_2O$.—*Abstracted from The Paper Industry.*

[1]J. Gould Bearn, *The Chemistry of Paints, Pigments and Varnishes.*
[2]Bunce, *Tech. Assoc. Papers* X, 100 (1927).
[3]P. Fuchs, *Chem. Ztg.* 50, 769 (1926).
[4]J. B. Meyer, *Buntpapier-Industrie* (Zurich 1931).
[5]W. Lerch, F. W. Ashton and R. H. Bogue, *Bur. of Standards J. of Res.* 2, 715 (1929).
[6]Private communication.

# *Coatings*

## Prevention of Mildew

Tests have recently been conducted by H. A. Gardner on paint ingredients for the prevention of mildew on painted surfaces. Mercury compounds or Paris green (in green paints) were found to give the best protection, but where poisonous products are undesirable, thymol and certain other compounds are effective. Some of these retard drying, and must be compensated for by extra drier in formulating paints. In acting as anti-oxidants, these materials may prolong the life of the film. When the toxicity of the added ingredient is low, rapid drying of the paint to prevent the attachment of spores is important. Application of an aqueous solution of mercuric chloride or of a solution of thymol in dilute alcohol is valuable before painting over mildewed surfaces, but thorough washing with water and soap or alkali has been found effective.

## Formulating Anti-corrosive Paints

The beneficial effect obtained by the addition of the cyanamides of soda, potash, or lime to anti-corrosive paints has been known for some time, and is attributed to the hydroxides formed on contact with water. However, even those cyanamides which do not readily decompose have anti-corrosive properties; the theory being that the liberation of the ammonia is the cause of the phenomenon. The cyanamide of cadmium has been found to be better than calcium cyanamide in anti-corrosive paints.

## Patents—Coatings

Comp. of chem. active material as variably resistant coating. No. 1,950,957. W. F. Wilhelm, to Marshall Field, Chicago.

Dilutible consolate mixture, to prepare metal for painting. No. 1,949,713 J. H. Gravell, to Am. Chem. Paint Co., Ambler, Pa.

Drying oil, oxidation catalyst and creosol as a coating composition. No. 1,948,582. J. K. Hunt & G. H. Latham, to du Pont & Co., Wilmington, Del.

Oil-soluble resin. No. 1,948,469. Kenneth M. Irey to Resinox Corp., N. Y. City.

Anti-fouling agent for ship paint-oils, of salts of sulfonic acid. No. 1,947,652. S. L. Langedijk, to Bataafsche Petr. Maatsch., The Hague.

Soluble diene resins from phthalic anhydride, glycerine and fatty acid. No. 1,947,416. A. Heck, to Cook Paint & Var. Co., Kansas City, Mo.

Drying oil, phenol and an aldehyde, with natural resin, as coating composition. No. 1,947,415. A. Heck, to Cook Paint & Varnish Co., Kansas City, Mo.

Lacquer composition from nitrocellulose, solvent, an organic acid and phthalic anhydride. No. 1,946,479. T. F. Bradley, to Ellis-Foster Co., Montclair, N. J.

# *Textiles*

## Vermin-proofing Fabrics

Of wide interest is a recent German patent which claims as a textile pest-proofing agent one containing a water-soluble compound of the formula $X_2SeO_n$, wherein $n$ is three or four and X stands for hydrogen, alkali metal, or ammonium which may be substituted by an organic radical. Treatment with ammonium selenate or ammonium selenite constitutes an example. Selenic acid, selenious acid, and selenious acid ethylene diamine afford further examples.

## Sizing and Dressing Starches for Textiles

The starches of value in the textile industry are rice, wheat, maize, and potato, and the corresponding dextrin and glucose from these products. Farina, or finely-sifted potato starch, is also much in use, but must be distinguished from the ordinary roughly ground starch, and also from potato meal. A. E. Wil-

liams, in *The Chemical Age*, states that the objects of dressing various textile materials are the treatment of the fibres with a substance more stable than the fabric itself, and the alteration of the properties of the goods so as to enhance their feel and appearance. When filling materials such as china-clay, gypsum, etc., are used, the dressing binds the filler and prevents it falling away. Varying with the result desired, the dressing is made up of materials such as textile soaps, oils, and fats, which enable the other ingredients to penetrate the fibres and not merely coat the surface. To impart a gloss to the goods, waxes such as Japan, paraffin, etc., are in general use.

Deterioration of the treated fabric may occur through the cellulose of the fibres being attacked chemically by unsuitable mixtures in dressings. Numerous cases occur in which potato starch—which invariably contains a trace of sulfurous acid from the starch-making processes—is used in a neutral or an acid mixture. This starch frequently contains 0.08 per cent. or more of sulfurous acid, and it has been shown that a starch having only 0.01 per cent. considerably weakens the fibres of the material by converting the cellulose to hydrocellulose. It is not easy to detect the presence of so small an amount of this acid in a fabric already dressed and stored for some time and damage in this way is not always appreciated.

The method of placing a damp indicator paper flat on the cloth and pressing on to the fabric by a weighted glass plate is in general use, but is unreliable, as it often shows an acid reaction from the free fatty acids of the oils used, although these acids have no appreciable action on the cellulosic fibres. Both oxy- and hydro-cellulose also give an acid reaction. The fibres possess the property of tenaciously retaining small amounts of acid, and it is quite possible for sulfurous acid to be present and yet give no indication on test paper. The Nessler Reagent is perhaps the most useful chemical test for hydrocellulose. With weak concentrations of hydrocellulose, the reagent gives a pale brown coloration, which changes from grey to black with increasing concentrations of hydrocellulose.

The effect of sulfurous acid on the fibres is to harden them, after a few days the acid slowly attacks the fibres, and the action is accelerated by heat, such as would occur in the laundering of the material. On a new fabric, the best test for determining the possible extent of damage by sulfurous acid is to heat the material in an oven to 115-120° C. for one hour, to allow the acid to attack the cellulose. The mechanical strength of the heated fabric is then tested, when, if much hydrocellulose is present, the fabric is easily ruptured.

A typical dressing is made of a mixture of potato starch, dextrin, magnesium sulfate, and textile soap. The first three of these have an acid reaction. The starch contains sulfurous; the dextrin, hydrochloric acid; and the commercial, magnesium sulfate sulfuric acid. It is usually neither practicable nor expedient to add just sufficient alkali to the dressing itself to neutralize the acids exactly, since the amount of these acids present cannot be ascertained by a simple titration. Further, the presence of excess alkali would be just as detrimental as excess acid. If, however, rice starch is substituted for dextrin in the above mixture, the acidity may be counteracted to a large extent by the faint alkalinity (NaOH) always present in rice starch.

A further advantage of using rice starch in conjunction with potato starch is that a more homogeneous and durable dressing results, provided the mixture is prepared in the correct way by gelatinizing the starches separately, then mixing together.

For imparting a gloss to fabrics, a dressing comprising a wax, starch, soap, and zinc chloride represents a typical example of those in general use. In such a mixture starch, if used, should be of the soluble variety or should be rendered soluble either before adding to the mixture or by the addition to the dressing of an agent capable of degrading the starch, i.e., malt extract. Ordinary starch, when used in gloss dressings, while assisting in the binding of the wax to the fibres, often produces a mottled appearance and detracts from the desired glossy finish. In such dressings a mixture of equal parts of dextrin and glucose can advantageously be substituted for the starch; these, being water-soluble, do not produce specks on the material, and have the same good binding properties as starch.

For sizing preparations with which it is desired to incorporate a high proportion of loading material, such as china-clay, it is often possible to effect a saving by substituting potato meal for the starch in general use. In such a mixture the non-starch portion of the meal is not detrimental; but at the same time, the starch content must be transformed to a suitable condition. Ordinarily, diastase, or one of the patent diastatic compounds now on the market, would be used to modify the starch, but in potato meal constituents are often present which prevent diastatic activity. In this case, consequently, the meal may be boiled for a short time in water containing a small amount of an organic acid, such as amidoethylsulfonic acid.

Maize starch, as purchased, while possessing excellent binding properties is often unsuitable for certain dressings which must stand repeated laundering; for it forms a thick viscous paste with boiling water, and is thus designated thick-boiling starch. Such starch imparts a rubber-like feel to the fabric, and garments made from it lose their shape, and become unsightly after several washings. A thin-boiling maize starch, while retaining its water-insoluble properties, penetrates further into the fibres of the material than ordinary thick-boiling starch, and thus will stabilize the fabric without imparting a rubbery feel.

Thin-boiling maize starch is prepared by agitating a mixture of one part of starch to two parts of water with 0.3 per cent. HCl (by weight of the starch) at a temperature of 60° C. for from one to two hours, depending on the degree of "thinning" required. (If the temperature and proportion of acid are incorrect, or if the stirring process is unduly prolonged, there is always a risk of the starch being turned into the undesirable water-soluble variety). The mixture is next rendered faintly alkaline to litmus by a weak solution of caustic soda, when it is ready for admixture with the other dressing materials. By neutralizing the hydrochloric acid, the harmful action of the latter on the fibres is avoided. Further, the deterioration of the starch itself is prevented, for the acid would gradually convert the starch to soluble dextrin, which would then wash out in the laundry. The presence of a trace of alkali also prevents hydrolysis of the starch to sugar by the enzymes in the starchy raw material, which have not been eliminated in the starch-making process. When the fabric is stored for some time, the appearance of mold on its surface is often due to enzymic action on the starch in the dressing.

Some fabrics are purposely given a waterproof character through the medium of the dressing. In such cases the fabric may be made porous or non-porous (air-tight) as desired. For the latter, the dressing may be produced by emulsifying a mixture of equal parts of rice starch—chosen because of its very fine granular structure—and linseed oil varnish with a suitable amount of warm water made slightly alkaline with ammonia. The starch in this case acts merely as a temporary carrier for the varnish, enabling it to penetrate the fibres thoroughly. At a later stage the starch is removed by immersing the treated fabric in water containing several per cent. of barley malt.

For certain fabrics liable to come into contact with chemicals—as, for example, filter-cloth,—the less filling and dressing material present the better. Usually, a cotton filtercloth, containing a few per cent. of pure wheat flour, necessary for weaving, is better in use than a more elaborately treated cloth.

## Month's New Dyes

### Inocyl Colors

Completion of a new line of Inocyl Colors is announced by Geigy. These cover approximately ten different shades, and are particularly adaptable to the garment dyeing industry because of their ability to color wool, cotton, viscose real silk, and acetate silk evenly. Also recommended for plaited hat material, consisting of ramie, hemp, and Cellophane, thus eliminating cross

dyeing and majorly shading where union results are required. The ten shades are yellow, brown, bordeaux, violet, marine blue, orange, red, brilliant violet, brilliant blue and black.

### Diazo Rubine BA

New Diazo color of General Dyestuff range. When dyed in the usual way for direct colors, then diazotized and developed with beta naphthol, produces full claret shades which discharge to a very good white with Rongalite. Dyeings are of good fastness, but fastness to light is only moderate. Possesses excellent fastness to rubbing, ironing, alkali, and acid.

### New du Pont Colors

Acele Diazo Black AS, prepared for acetate yarn and fabrics, thus further extending company's line of acetate colors. Ponsol Navy Blue RA, a double paste for printing and dyeing cotton and rayon materials. Lithosol Blue 6G, an entirely new product of excellent characteristics for lake and dry color manufacture. Thioflavine TCN, a higher concentration of an older product, a color which meets special needs in textile finishing as well as in dry color processes.

Four additions to the du Pont Sulfogene series of sulfur colors are Olive Drab YCF, Direct Blue BRCF, Golden Brown RCF, and Dark Brown GNCF. These are said to incorporate improvements in manufacture, particularly in allowing a better control of copper content in materials to be dyed.

### New Dyestuff Dictionary

A proposed new azo dyestuff nomenclature, explained by Dr. H. Eichler in a recent issue of *Chemiker-Zeitung,* sharply distinguishes between azo and diazo components. The components are indicated by their constitutional or commercial names and digits are inserted as indices to indicate the number of azo groups present. Furthermore, monoazo, diazo, trisazo and tetrakiazo dyes are respectively designated by the letters E, Z, T, V. Azo and diazo components are respectively grouped to the left and right of these letters. The coupling position (in the azo components) is distinguished by the indices used to denote the position of entry of the azo groups themselves. Where the coupling position is unknown, the small letters s, a, and n are placed in the exponent position to signify acid, alkaline and neutral coupling respectively. Chrysoidine would be designated 1, 3-phenylenediamine$^{4}$ E aniline; naphthol black (No. 600 in Schultz's register) R—acid$^{a}$, Z *a*—naphthylamine$^{8}$ E 1—naphthylamine—4, 6—disulfonic acid.

### Patents—Textiles

Organo-mineral acid treatment of textile and other cell. materials. No. 1,950,024. Henry Dreyfus, London.

Cellulose with plasticizer, and derivative. No. 1,949,434. Geo. Schneider, Montclair, to Celanese Corp. of Am., N. Y. City.

Chlorine-freeing treatment of cellulose. No. 1,948,517. C. Dreyfus & Geo. Schneider, to Celanese Corp. of Am., N. Y. City.

Ultra-violet radiation to prevent oxycellulose, increasing tensile strength. No. 1,948,276. A. J. Pacini, to Milprint Prod. Corp., Milwaukee, Wis.

Formaldehyde-alcohol solution to modify acetyl cellulose textiles. No. 1, 947,928. K. Beck, Berlin-Charlottenburg, Germany.

Amino-anthrapyramidine bath for dyeing acetate silk. No. 1,947,855. K. Koeberle & J. Mueller, to Gen. Anil. W'ks, N. Y. City.

Cellulose esters of hydroxyalkacyl groups; and the mfr. of substitution derivatives of cellulose. Nos. 1,947,463-4. Henry Dreyfus, London.

Process for dyeing cellulose acetate materials and non-saponifying treatment to prevent creasing. Nos. 1,947,038-9. G. H. Ellis and as to No. -038, G. H. Ellis & H. C. Olpin.

Barium sulfate solution in treating fabrics. No. 1,947,024. E. A. Slagle, to Am. Smelting & Ref. Co., N. Y. City.

## *Rubber*

### Rubber Bonded Asbestos Articles

The addition of latex or other dispersions of rubber, together with a colloid protective, to an extremely dilute sludge of asbestos in a paper making beater, then adding a coagulant is open to several objections. One of the more serious is that the waterborne fibers deposited from the water on the separating screen of a paper making machine are interlocking in two dimensions only and usually greater longitudinally than transversely. Such an arrangement of fibers produces a sheet having greater longitudinal than transverse tensile strength as well as characteristic striations with consequent tendency to split when bent. Also the wet casting of such slurries results in lines of cleavage or weakness representing lines of unreenforced rubber bond.

These difficulties are eliminated in a new process, outlined in the *India Rubber World,* by which the fibers are assembled in random arrangement in three dimensions while in a concentrated slurry and before coagulation of precipitation of the rubber. The latter is effected in a forming container by means of heat without disturbance of the fiber arrangement. In outline this process is conducted as follows:

A concentration of three to five per cent. of short fiber asbestos is dispersed in a large amount of water containing a dispersion agent such as caustic soda. A paper maker's beating engine may be satisfactorily used or any other agitating device which admits of violent agitation of the fiber in the dispersing solution. Under such treatment the mass appears slimy, feels unctuous, and the fibers do not sink rapidly, nor do they form a compact layer. After the fiber is thoroughly dispersed, pigments, fillers, and vulcanizing agents may be added in such amounts as to allow cure of the finished product which will include rubber. After these additions the excess of water may be removed in any convenient manner such as a thickener or a pressure filter box.

The moisture content is reduced until the mass loses its free mobility. To this non-fluid mass, rubber latex or an artificial rubber dispersion is added. In any event a colloid protective is added to the rubber dispersion. Heat coagulable proteins are preferred, of which hemoglobin is perhaps the most satisfactory. A small amount of zinc hydroxide or zinc oxide added to the original slurry expedites later coagulation. Fifteen per cent. of rubber on the weight of fiber is a suitable ratio of bonding rubber to filler, and the addition of rubber in this ratio and in the form of latex containing 30 per cent. rubber is enough to impart sufficient mobility to the wet fibers.

The mass thus formed has the appearance of mud and may be readily poured into a receptacle. The latter is then subjected to a vibratory motion or rapping impact which assists in distributing uniformly the fibers without disturbing their random arrangement. Then as the container is maintained in a horizontal position, heat is applied to the outside, as in a closed steam chamber. After the mass has been raised about to the boiling point, a marked change in consistency results, and the fiber has more nearly the appearance of ordinary wet asbestos which has not been subjected to dispersion with the aid of dispersing agents. Removal of the aqueous fluid remaining is effected by drying, preceded by application of pressure by means of a plunger applied to the exposed surface.

At this stage the mass has sufficient coherence and strength to be turned out of the container in which it was formed and can be transferred to a drying apparatus without the need of any edge support. Because of its wet strength the mass may be cut into commercially suitable units. The trimming waste that results may be added to the next batch of fiber to be dispersed. Final drying should be accomplished at a temperature sufficiently low to avoid vulcanization of the rubber. Drying can be done at 150° F. without detriment. After drying the mass is consolidated by pressure and final passage through squeeze rolls. Vulcanization is effected in any convenient way suited to the special form of the finished product.

### Accelerator Research

Advance in the chemistry of accelerators has been largely in submitting accelerators in general use to further treatment. Formerly toxic aniline and toluidine gave place to the thioureas and were popular in spite of their quick "kick-off" properties and the fact that they were really slow accelerators. Dr. W. J. S. Naunton, W. Baird, and H. M. Bunbury recently submitted a paper before the London Section, Society Chemical Industry, in which they described tests whereby heating thiocarbanilide with sulfur was tried with mercaptobenzthiazole as

the result, but this accelerator was too fast to be used in the equipment available at that time.

The next step was the removal of the sulfur from thiocarbanilide, the resulting product being diphenylguanidine. This proved fast, but not too much so. More than this, it was safe; safety being the essential feature in the accelerator which introduced most of the rubber technicians to the new speeded-up technique, with the result that within a very short time consumption rose from only a few pounds per month to several thousand tons per year. Meanwhile mercaptobenzthiazole loomed in the background, a substance discovered before the world was ready for it.

Diphenylguanidine not only speeded up production, it increased resistance to abrasion; moreover, it maintained this resistance due to the excellent ageing characteristics it imparted to the rubber. This resistance was the "shop window" of the tire trade. After a few years the tire trade in general changed over from diphenylguanidine to mercaptobenzthiazole, but in several cases, especially where the equipment was not provided with improved cooling devices, considerable trouble arose with scorching.

It was a more economic proposition to modify the accelerator than to alter the equipment, so experiments were made with a view to converting mercaptobenzthiazole into a product which had the same good resistance to abrasion and the same ageing properties, but with the safety of diphenylguanidine. Excessive use of softeners, as first tried, decreased the resistance to abrasion; acid retarders suffered from the defect that they tended to retard the actual cure at the vulcanizing temperature. Modifying the accelerator was a more satisfactory method; this could be done by actual chemical substitution or else by mixture of one or more other accelerators. Either of these methods might result in the production of a true delayed action accelerator which was ideal for use in articles to be cured in a big multi-daylight press, and also for use in sponge rubber, but could not be used for the curing of articles shaped on formers, since the danger would arise of sagging by softening before setting up. For such articles the best results would be obtained by using an accelerator with a sufficiently high critical temperature not to scorch during processing, but to give a quick set-up at vulcanizing temperature.

Much work has been done on modifying the accelerator to the end mentioned in connection with tire manufacture and considerable progress made by converting mercaptobenzthiazole into one of its salts. The cadmium salt was fairly good, the antimony reasonably so and the lead not particularly good. In this way it was possible to obtain a mercaptobenzthiazole accelerator without scorching. In the same way the mono-sulfide, although practically useless in itself, became an excellent accelerator when used in combination with another, and used in combination with diphenylguanidine was an accelerator which gave all the desirable qualities, especially for such purposes as solid rubber tires and giant pneumatics where the question of resiliency was very important.

## Patents—Rubber

For making a benzothiazyl ester. No. 1,951052. M. W. Harman, to Rubber Ser. Labs. Co., Akron, O.

Chlorinated rubber-diphenyl, and solvent, in coating composition. No. 1, 950,894. Wm. Koch, to Hercules Powder Co., Del.

Aqueous dispersion of rubber—plasticizer and water-soluble colloid. No. 1,950,451. H. L. Levin, to Pat. & Licensing Corp., N. Y. Allied to No. 1,950, 452-3. H. L. Levin, to Pat. & Licensing Corp., N. Y.

Salts of diphenylguanidine. No. 1,950,067. R. L. Sibley, to Rubber Service Laboratories, Akron, Ohio.

Mercaptophenol preservative of rubber. No. 1,949,240. H. M. Bunbury, W. J. S. Naunton & K. W. Palmer, to Imperial Chemical Ind., England.

Vulcanization accelerator. No. 1,948,317. L. B. Sebrell & A. M. Clifford, to Wingfoot Corp., Del.

Alkali process for producing rubber insulation poor in albumen, for submarine cables, etc. No. 1,947,949. H. Miedel, Frankfort, to Revertex Ltd., London.

Sulfur with hydrogen, phosphorous or chlorine as vulcanizing agent for fibrous rubber product. No. 1,947,759. E. N. Cunningham, to Goodrich Co., N. Y. City.

Naphthyl or phenyl antioxidant in compounding rubber. No. 1,947,458. W. S. Calcott & W. A. Douglass, to du Pont Co., Wilmington, Del.

Rubber vulcanization process, with accelerator from an acid amide-amidohalide. No. 1,946,704. G. L. Magoun, to Rubber Service Labs., Akron, Ohio.

## Patents—Naval Stores

Ethylene diamine treatment for refining sulfate wood turpentine. No. 1,938,693. W. W. Gillespie & D. M. Wadswo to Bogalusa Paper Co., Bogalusa, La.

# *Metals and Alloys*

## Copper Alloys

A remarkable series of new copper alloys has been developed, possessing the predominating feature that by simple heat-treatment their hardness, strength, and other mechanical properties can be very much improved. The series, known as Kunial, cover brass, copper, nickel, silver, and bronze. The commonly used copper alloys are annealed and softened by raising them to temperatures in the region of 400-600° C., but similar heat-treatment may treble the hardness and double the tensile strength of the Kunial alloys. The difference between the new alloys and the ordinary then becomes immediately apparent. Yet, in spite of this marked difference, Kunial alloys can be extruded, rolled, drawn and cold worked exactly in the same way as ordinary brass, for the production of rod, wire, tubes, strip, and sheet.

Kunial brass is an alloy of copper and zinc, together with other added elements. The copper and zinc contents may be varied within wide limits, but in all cases the unique property of hardening and strengthening by suitable heat-treatment is retained. By heating the soft quenched alloy to 500° C., the diamond pyramid hardness is increased by about 100, the limit of proportionality and proof stress are multiplied four-fold, the tensile strength is increased by 14 tons per square inch, while the elongation is only halved. If the cold-worked alloy is heated to 450° C., the diamond pyramid hardness is increased by about 40, the limit of proportionality and tensile strength are considerably increased, but the increase in strength is accompanied by an increase in elongation. While these figures refer specifically to a Kunial brass strip, they are typical of the changes in mechanical properties which take place in all Kunial alloys when suitably heat-treated. These remarkable changes in mechanical properties brought about by heating alone are similar to those met with in such alloys as duralumin and beryllium copper.

Kunial brass is an ordinary commercial alloy, and while the raw materials used in its composition are more expensive than those in ordinary brass, for products of equal strength, it may be possible to produce the finished article cheaper by this method than ordinary brass. This entire range of alloys possess high resistance to corrosion by sea-water, and possible applications are wide.

## Colored Aluminum

Under a new process aluminum may be permanently dyed in a variety of colors and effects, extreme simplicity being the keynote of this process which is rendered possible by the special properties which aluminum possesses as a metal. Aluminum oxide has definite mordant properties, so that on simple oxidation the surface of the metal becomes automatically prepared for the dyeing process. Oxidation is effected by an electrolytic method, in which the aluminum articles to be treated form the anode of an electrolytic cell. Electrolysis results in intensive oxidation of the surface of the aluminum, the porosity, flexibility, and hardness of the anodic film so formed being governed by such factors as the current density and temperature of the solution. Of the various acid baths tried, only dilute sulfuric acid has proved capable of treating any form of aluminum.

Process of oxidation consists of three treatments: (1) Cleansing and polishing of the aluminum objects; (2) anode oxidation; (3) washing of the oxide film. The immersion time varies from ten minutes to one hour, the voltage being of the order of 10-15, with the bath maintained at 15-20° C. After this treatment, the aluminum presents a silvery-white surface, then if simply immersed for a few minutes in a bath containing an organic or a mineral coloring matter, will take up the color, just like wool or cotton.

The color is then made proof against abrasion by immersion in a "sealing-bath," which causes the oxide crystals to lie down one over the other, forming a laminated structure, thus securely

locking the color into the metal. If this sealing process is carried out before dyeing, an extremely hard silvery surface is formed which will not take up color.

Most of the organic coloring matters, such as the anthraquinones and alizarines, may be used, and the finish much more permanent than that given by lacquering or plating. The color range extends from jet black and cream to the most delicate pastel shades, and includes the metallic colors, gold, bronze, and copper. All such colors are remarkably sunfast, but where exceptional heat fastness is required, mineral coloring matters, such as cobalt salts, are naturally called for.

## Patents—Metals

Ammo. sulfate sol., as means of coloring copper or its alloys. No. 1,951,304. Freeman and Kirby to Copper & Brass Res. Ass'n, N. Y. City.

## Patents—Miscellaneous

### Petroleum

Dihydroxybenzene as decolorizer of refined petroleum distillates. No. 1, 951,205. Rather, Reiff & Beard, to Socony-Vacuum Corp., N. Y. City. Allied grants, Nos. 206-7-8.

Denatured alcohol, sulfur dioxide-petr. oils. No. 1,949,244. W. N. Davis & J. T. Rutherford, to Stan. Oil Co. of Cal., San Francisco, Calif.

Compound of the heavier metals of the VI group as a higher activity catalyst. No. 1,948,408. R. N. Watts & W. E. Spicer, Baton Rouge, to Standard-I.G. Co.

Recovery of valuable constituents from hydrogenation catalysts. No. 1, 948,407. R. N. Watts, Baton Rouge, to Standard-I.G. Co.

$SO_2$ treatment with steam pressure variant in refining overhead products of petroleum. Nos. 1,947,868-9. J. C. Morrell & G. Egloff, to Universal Oil Products, Co., Chicago.

To make water-soluble petroleum sulfonates. No. 1,947,861. L. Liberthson, to L. Sonneborn Sons, N. Y. City.

Isopropyl ether and acetone in dewaxing petroleum oils. No. 1,947,359. E. W. Reid, Pittsburgh, to Carbide & Carbon Chem. Corp., N. Y. City.

Gum-inhibitor for motor fuel, mixing a diaryl arylene diamine. No. 1,947,219 P. I. Murrill, to R. T. Vanderbilt Co., N. Y. City.

### Fertilizers, Insecticides, Disinfectants

Method and material for cleaning metal. No. 1,949,090. R. R. Tanner & H. J. Lodeesen, to Matal Fin. Co., Detroit, Mich.

$HNO_3$ on phosphates, with $MeNO_3$ nitrating agent for stable fertilizer. No. 1,950,945. Emil Luscher, to Lonza Elec. W'ks, Basel, Sw.

Parasiticide, coconut oil soap and orthophenylphenol. No. 1,950,818. J. M. Schaffer & F. W. Tilley, Wash. D. C.

Disinfectant—acid reactors and thiocyanogen compounds. No. 1,950,315. Lockemann, Gerngross, Rulke & Ulrich, Berlin.

N and O acid solutions to produce nutrient salts to speed seed growth. No. 1,950,068. P. Spangenberg, Germany.

Insecticide. No. 1,949,722. Hugh Knight, Cal., to Emulsoids Inc., N. Y. City.

Dry, dusty fertilizer salt mixture. C. J. Hansen, Ger., to Koppers Co., Pittsburgh, Pa.

For conversion of superphosphate-contained gypsum into ammonium sulfate. No. 1,949,129, H. Oehme, to Chem. Fabrik Kalk, Cologne, Germany.

N-phosphorous fertilizer, incorporating ammonia. No. 1,948,520. E. W. Harvey, to The Barrett Co., N. Y. City.

Separate ammonia treatments in making superphosphate fertilizer. No. 1,948,454. C. L. Burdick, to du Pont Co., Wilmington, Del.

Method of granulating calcium cyanamid to below 5% $H_2O$. No. 1,947,971. G. E. Cox, to Amer. Cyanamid Co., N. Y. City.

Solid mixed fertilizers carrying ammonium nitrate. No. 1,947,601. C. Krautch, C. Eyer & G. Baetz, to I. G. Germany.

Naphthalene insecticide for codling moths. No. 1,947,169. Wm. K. Price, Selah, Wash.

### Tanning

Phosphate fertilizer of high crushing and tensile strength. No. 1,947,138. Beverly Ober & E. H. Wright, to Oberphos Co., Baltimore, Md.

Polyhydric alcohol ester and organic acid, in treating hides, etc. No. 1,949, 990. K. Brodersen & H. Wagner, to I. G., Frankfort, Germany.

Tanning substances, phenol ethers. No. 1,948,667. G. Kraenzlein & A. Voss, to I. G., Frankfort, Germany.

Urea-aldehyde solutions for vegetable tanned leather. No. 1,947,513. M. Bergmann, Berlin.

# *Company Booklets*

**C122. American Cyanamid Co.**, 535 5th ave., N. Y. City. "American Hortigraphs and Agronomic Review (March-April) continues to be just about the most "newsy" agricultural bulletin published.

**C123. American Zinc Sales Co.**, P. O. Box 1428, Columbus, O. and its branch offices. Purpose of the booklet is to give a better understanding of the functions of zinc oxide in various industries and to explain development and results of company's research program over past decade. Ample space is devoted to a description of the company's leaded and lead free oxides, with chemical data and suggestions of the purposes for which each is most popular. Photomicrographs of the various grades, magnified 1200 times form an interesting feature.

**C124. Bakelite Corp.**, 247 Park ave., N. Y. City. Sixth edition of this now famous booklet contains 48 pages and describes in detail Bakelite molding materials and their uses, and gives a brief description of the molding process and needed equipment. It is magnificently illustrated and really is in the nature of a textbook.

**C125. Bakelite Corp.** Molders and others will find "Bakelite Molded Stock Colors" actually shown in true color a very useful chart to have filed away.

**C126. Brown Co.**, Portland, Me. *The Solka Age* monthly magazine of the Brown Co. while a comparative newcomer in the field of house-papers has already jumped into the front rank with the leaders. February issue contains a most interesting and instructive article on Eastman Kodak's plant. Several additional articles deal with new and novel uses for "Solka" purified cellulose.

**C127. E. I. du Pont de Nemours & Co.**, Wilmington, Del. Chemicals for the Petroleum Industry is a series of 5 booklets with the following titles: (1) "Gum Formation in Gasoline"; "Measurement of Gum Stability of Gasoline"; (2) "Gum Formation" Control of Gum Formation in Gasoline by Antioxidants; (3) "Measurement Method and Means of Preventing Formation of Undesirable Gum in Gasoline; (4) "Gasoline Antioxidants" Their Purposes, Properties, Uses and Effects; (5) "Extreme Pressure Lubricant Bases" Their Purposes, Properties, Uses and Effects.

**C128. Eastman Kodak Co.**, Rochester, N. Y. Eastman has issued a new price catalog for Eastman organic chemicals. Every purchaser of chemicals should have this price-list on file.

**C129. Faure, Blattman & Co.**, Holland House, Bury st.,London, E. C. 3. "Review of the Oils and Fat Industries—1933" has long since become looked upon as the authoritative statistical international review of this important industry and it requires no lengthy review.

**C130. Givaudan-Delawanna, Inc.**, 80 5 ave., N. Y. City. *The Givaudanian* is a newcomer but one that is finding wide favor for its "newsy" comment and practical information on manufacturing topics. February issue features "Resins Were the Perfumes of the Orient—They Still Serve as Fixatives." In the industrial section is featured "Deodorized Plastics Solves Sales Problems"; also deodorized paints and enamels and deodorized fabrics. Sense of smell is rapidly being made use of in selling appeal in industries that never dreamed that odor would play a part.

**C131. Glyco Products Co.**, Bush Terminal Bldg., Brooklyn. Latest copy of the Glyco catalog is now off the press. It deals extensively with emulsifying agents, synthetic resins and waxes, polishes, sprays, etc.

**C132. Grasselli Chemical Co.**, Cleveland, O. Folder "The Control of Important Tobacco Insects With Dutox" is now ready for distribution.

**C133. Halowax Corp.**, 247 Park ave., N. Y. City. An attractive folder which describes "What Halowax Is and What Halowax Does" (flame-proofing, compound polishes, protection against corrosion, as a plasticizer, etc.).

**C134. Hercules Powder Co.**, Wilmington, Del. "Hercules Chemical Cotton—Best Source of Cellulose" is a 30-page authoritative story of the manufacture, uses and methods of testing chemical cotton. Splendidly illustrated.

**C135. Hercules Powder Co.** A 4-page leaflet describes "Cabinol" a naval stores product useful in combating wood borers and powder post beetles.

**C136. Hercules Powder Co.** A 4-page booklet describes "Truline Binder" used as a dry binder and in oil and sand cores.

**C137. Hercules Powder Co.** New booklet describes "Hybrex"—an insecticidal paint for apple trees. It is a pine oil product developed for war upon the codling moth in the dormant season.

**C138. Hercules Powder Co.** *Hercules Mixer* for February features "From Cotton Field—To Camera Film"; describes "Tornesit" new chlorinated rubber of interesting uses and future possibilities; plus the useful inter-company news.

**C139. Mallinckrodt Chemical Works**, St. Louis. March price list reports several important price changes.

**C140. Merck & Co.** March price list is available.

**C141. Michigan Alkali Co.**, 10 E. 40 st., N. Y. City. "Malum" is a new, clean, inflammable gas perfected for fumigation. Full details are now available in booklet form.

**C142. Philadelphia Quartz Co.**, 121 S. 3 st., Philadelphia. A brief story of the history of the artificial fibres and the part played by silicates of soda in this development told in a most interesting and absorbing manner.

**C143. Pittsburgh Plate Glass Co.**, Grant Bldg., Pittsburgh. An index of products made by Pittsburgh Plate Glass and subsidiaries and a directory of plant locations and sales and servicing stations.

**C144. Rossville Commercial Alcohol Corp.**, Terre Haute, Ind. This month's issue gives a very useful list of the better known kinds of alcoholic liquids in natural groups, based on their approximate percentages of alcoholic content.

**C145. St. Louis Chamber of Commerce News for February** is an elaborate drug and chemical number. Nearly every one is cognizant of the importance of St. Louis in the industrial chemical picture of the country but one learns HOW important from Edgar M. Queeny, Monsanto president; Arthur C. Boylston, Mallinckrodt; James Varley, Baird & McGuire; D. W. Edgerly, Titanium Pigment and others. There is a charge for this paper and inquiries should be directed to the Chamber, 511 Locust st.

**C146. Superez Corp. of America**, Cumberland, Md. "Superez" is a new denture resin of interesting properties.

**C147. Texas Gulf Sulphur Co.**, 75 E. 45 st., N. Y. City. "Sulfur, An Essential To Industry and Agriculture" is an exhaustive and authoritative treatise on the subject of sulfur, uses, data, etc., prepared with the cooperation of the company's Multiple Industrial Fellowship at Mellon Institute. No user of sulfur should be without this splendid brochure.

**C148. R. T. Vanderbilt Co.**, 230 Park ave., N. Y. City. *The Vanderbilt News* authoritative monthly devoted to technical rubber matters and materials in its March issue features "The Automobile as a Testing Instrument"; "The Automobile Tire of 1933 and Why it Gives Outstanding Service"; "Accelerator Incompatibility in Adjacent Stocks."

**C149. Wilbur White Chemical Co.**, Owego, N. Y., has prepared a series of booklets on wax emulsions. The first is Wax Emulsions As Floor Polishes. The others are:

**C150. "Wax Emulsions For the Rubber Industry."**
**C151. "Wax Emulsions For the Paper Industry."**
**C152. "Wax Emulsions As Shop Coatings."**
**C153. "Wax Emulsions For The Leather And Shoe Industry."**
**C154. "Wax Emulsions What They Mean To The Textile Industry."**
**C155. "Wax Emulsions For Fruit and Vegetables."**
**C156. "Wax Emulsions For Nursery Stock."**

**C157. General Plastics, Inc.**, North Tonawanda, N. Y. *Closure News* for March again lists some interesting new uses for Durez. Most appealing is the new razor handle perfected for "Barbasol"; also a top for Texaco's new dry cleaner package. "Packaging Liquor-1934 Style" is illuminating.

**Chemical Industries,**
**25 Spruce Street, New York City.**

**I would like to receive the following booklets; specify by number.** ..............................

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C. April

# Chemical Production

*A digest of plant management, design, equipment and containers for the makers of chemicals.*

## Prussian Blue Manufacture

Among the inorganic precipitated pigments Prussian blues and chrome yellows are probably the 2 classes which have most successfully combated the competition of coal tar lakes. Chrome yellows enjoy their position to their covering power, strength, excellent drying properties in oil media, and advantages of application. Prussian blues are distinguished, in addition, by their fine shade and permanence in solvents, diluents, and weak acids. A summary of the properties of the Prussian blues is given in *Farben-Zeitung* (Dec. 30, '33, & Jan. 6, '34), writer advancing opinion that a wide field of further application is open to Prussian blues.

One problem still to be solved is the manufacture of a perfectly lustreless Prussian blue for use as a pigment in cellulose lacquers. It is true, it is pointed out, that some of the new brands made expressly for the purpose, do show a marked advance; but, none the less, on extensive surfaces coated with cellulose lacquer, there is still a more or less reddish lustre apparent when the surfaces are viewed from certain angles.

Commercial Prussian blues differ not only in structure and color, but also in their behavior towards binding media. So-called "potash blues," made with the aid of yellow prussiate of potash, have the finest dark color, are hardest, and have strongest metallic lustre. Soda blues are not only easier to grind, but have a somewhat less marked lustre. Again, while potash blue has a pure indigo blue tone in bulk, soda blue has a darker and more blackish green tone. Steel blues are usually softer and more voluminous than the true Prussian blues. Their softness increases with the brightness of their tone, while their metallic lustre decreases with the fineness of grinding. On reduction with white pigments some varieties of steel blues show a purer blue tone than does the purest Prussian blue, and their tinctorial strength is often higher than that of Prussian blues. Owing to their greater softeness, mixing operations with steel blues are much shorter and easier than with Prussian blue. Their metallic lustre is usually higher in the brighter tones than in the duller tones. Steel blues used in the printing industry are usually called "Bronze Blues."

Properly prepared Prussian blue is completely insoluble in water and organic solvents. So-called "soluble Prussian blues" are a variety of their own, and are made by the treatment of insoluble blue with yellow prussiate of potash or oxalic acid, or both together. So-called oil solubility of Prussian blues is in most cases not solution at all, but the carrying over of the fine particles of the pigment by the oil, and can be minimized by the addition of volatile media to the oil-ground color. While many organic acids, such as oxalic, citric, and tartaric have a comparatively slight solvent action on Prussian blues, they do not markedly interfere with color tone. Very dilute mineral acids, weak acid gases and vapors are without deleterious effect on Prussian blues, whether these latter are in bulk or in the form of paint film. Where alterations in color have been observed, in many cases they have been only after many years of exposure. By the direct action of strong mineral acids tone of Prussian blue changes gradually into a dull dark green which remains fairly permanent. Sulfuric and nitric exert this effect much more markedly than hydrochloric, although the final result is the same in all cases. Strong alkalies and their solutions decompose Prussian blue to a yellow which finally changes into a dark brown. Dilute soda solutions mainly produce a reddish undertone. If ammonia is the cause, when this has volatilized original blue color reappears. Effect of alkalies is also given by alkali-containing materials, such as certain adhesive pastes.

By itself Prussian blue is among the fastest-to-light of pigments, but a little precaution must be taken when using it mixed with white or yellow pigments. For instance, mixtures of chrome yellows and Prussian blues, the so-called "chrome greens" alter their shade under the influence of light in all media much quicker than do the zinc greens—*i. e.*, mixtures of zinc yellow and Prussian blue. Former, when employed as varnish pigments in the open, darken in a few months, while during same period the zinc greens suffer scarcely any alteration in shade. Earlier belief that the darkening of chrome greens in sunlight is due to the poor quality of the Prussian blue used has been shown to be erroneous, change being due to the alteration in the lead chromate itself. With well-made zinc greens, outdoor exposure for years may be necessary before the original bright green shades changes towards blue. In regard to mixtures with white pigments, it has been shown by the investigations of G. Zerr that the changes which may take place under the influence of light are due to the white constituent. For instance, it has been found that while Prussian blue mixed with zinc white was stable to light for a 35 days' test in the open, similar mixtures with lithopone or white lead revealed a modification in tone after exposure towards the green side; while mixtures with titanium white revealed on exposure a reduction in depth of the blue. In general, Prussian blues are not resistant to high temperatures, and are not to be employed in paint and varnish products to be exposed to temperatures above 100° C.

Writer considers that Prussian blues should be able to regain the position they once held as paper pigments; while he also believes that the printing-ink industry should offer a far better market than it is doing at present. What is required for printing inks, though, is a steel blue of greater softness and fineness than

at present obtainable. At present, ink manufacturers on the Continent are making their own bronze blues by the very tensive and lengthy grinding of the steel blues of commerce.—*Chemical Trade Journal*, British, Jan. 12, '34, p. 25.

# *Heavy Chemicals*

### Simultaneous Sulfuric and Nitric Production

Sulfuric and nitric acids are simultaneously produced in a French process by passing sulfurous and nitrous gases of low water content and pre-cooled to temperatures not exceeding about 100° C., together through an absorption system in co-current with a liquor containing sulfuric and nitrosyl sulfuric acids, the temperature being maintained low to avoid decomposition of the latter and to cause progressive absorption of both gases. Concentrated liquor so obtained is denitrated by heat and water vapor, concentrated nitric acid being obtained from the gaseous product and concentrated sulfuric from residual liquor. Absorption system comprises 3 towers irrigated with sulfuric and nitrosyl sulfuric acids, that in the 1st tower being relatively dilute and periodically transferred to the 2nd, and thence to the 3rd. Liquid is cooled to maintain a temperature of about 40° C. Acid from last tower is decomposed in a denitration column at about 130-240° C. by water or dilute nitric, and water vapor, air being introduced at the base. 95-100% nitric is condensed at the exit, remaining vapors, about 40% $NO_2$, being absorbed to give 70% acid which may be returned to the column. Part of the sulfuric withdrawn from the column is fed to the absorption system, and part denitrated and concentrated in a Glover tower.

### New German Zinc Oxide Process

In a German process for obtaining zinc oxide by burning a mixture of zinciferous originating material with coal dust in burners of the coal dust type and precipitating the oxide from the cooled effluent gases, originating materials containing zinc sulfate, especially flue dust derived from the roasting of zinc ores, are employed, and excess of combustion air is avoided. The effluent gases are cooled by a spray of water, thereby precipitating zinc oxide and oxidizing metallic zinc present.

### Copperas Manufacture

Best method for the production of copperas from liquors formed in pickling of iron and steel with nitre-cake solutions, is one depending upon the different speeds of disaggregation of the crystals of sodium sulfate and ferrous sulfate. When the exhausted liquors are allowed to evaporate slowly at about 20° C., the 2 sulfates do not form the double salt, but crystallize separately especially in the upper layers. Glauber salt disaggregates first, and loses its water of crystallization, while the ferrous sulfate retains its 7 molecules of water. To accelerate the process, it is necessary to agitate mass about once every 24 hours, the eventual outcome being the transformation of the whole of the sodium sulfate into fine anhydrous powder, which may be easily separated from the copperas crystals by sieving. The residue on the sieve contains, on the average, 91% of copperas, the powder going through being 75% sodium sulfate. The usual method of separation, based on the cooling of the solutions to —5° C., is condemned owing to the expense of its working in other than cold weather.—*Chimie et Industrie*, December, 1933. Digested from article by H. A. Goloube, *J. Khim. Prom. '33, 10, 64.*

### Patents—Chemical

Mfr. of 3-hydroxyseleno-naphthene. No. 1,949.,815 Schneider, Germany, to Agfa Ansco Corp., Binghamton, N. Y.

Compositions of matter with sulfur in colloidal distribution. No. 1,949,797 H. Kaufmann, Munster, Germany.

Plumbite-soluble sulfide-adsorbent refining of cracked hydro. oils. No. 1,949,756. J.C. Merrell, to Universal Oil Prod. Co., Chicago.

Hydrochloric acid-green sand treatment of hydrocarbon oils. No. 1,949,749. C. D. Lowry, to Universal Oil Prod. Co., Chicago.

Thiourea from ammonium thiocyanate. No. 1,949,738. M. Donauer, to Koppers Co., Arlington, N. J.

Di-thiophosphate compounds. No. 1,949,629. C. J. Romieux & K. D. Ashley, to Am. Cyanamid Co., N. Y. City.

Solvent composition for removing carbon deposits from engine cylinders. No. 1,949,588. C. A. Thomas & C. A. Hochwalt, to T. & H. Labs., Dayton, O.

Cyanamid seed disinfectant. No. 1,949,485. Vartkes Migrdichian & J. L. Horsfall, to Am. Cyanamid Co., N. Y. City.

Hydrocyanic acid indicator of the presence of toxic substances. No. 1,949, 466. L. Gassner, to Deutsche Gess. fur Schadlings-Bekampfung, Frankfort, Germany.

Esters of dehydrogenation of polyhydric alcohols. No. 1,949,425. W. A. Lazier, to du Pont Co., Wilmington, Del.

Lysed bacterial proteins for topical application. No. 1,949,375. F. G. Jones, to Eli Lilly & Co., Indianapolis, Ind.

Dialkyl sulfates from gaseous olefines. No. 1,949,369. H. L. Cox, to Carbide & Carbon Chem. Corp., N. Y. City.

Dialkyl sulfates from gaseous olefines. No. 1,949,366. T. F. Carruthers, to Carbide & Carbon Chem. Co p., N. Y. City.

Means and catalyst for mfr. methyl ether. No. 1,949,344. J. C. Woodhouse, to du Pont Co., Wilmington, Del.

Preparing esters of organic acids. No. 1,949,267. J. R. Buckley & C. A. Doran, Parlin, to du Pont Co., Wilmington, Del.

Precipitation of cellulose ester, releasing sulfur dioxide. No. 1,949,213-4. D. B. Mason, to U. S. Industrial Alcohol Co., N. Y. City.

Method of purifying calcium chlorate. No. 1,949,204. S. B. Heath, to Dow Chem. Co., Midland, Mich.

Mineral acid dispersion of humic material to produce dyes. No. 1,949,147. L. P. Dove, Hinsdale, Ill.

Neutral ester of ortho phthalic acid with a monohydric secondary alcohol. No. 1,949,093. R. H. Van Schaack, to Van Schaack Bros., Chicago.

Oxidized linseed oil. No. 1,949,028. A. Schwareman, to Spencer Kellogg & Sons, Buffalo, N. Y.

Improving unstable acyl celluloses. No. 1,948,903. E. Correns & A. Mohring, to I. G., Frankfort, Germany.

Cyclic hydrocarbons from organic compounds of one or more double bonds. No. 1,948,891. A. J. van Peski, to Bataafsche Petr. Maatsch., The Hague.

Vinegar making Process. No. 1,948,836. C. S. Ash, to California Packing Co., San. Francisco, Calif.

Fractioning of oil oxidation products. No. 1,948,817. J. H. James, to C. P. Byrnes, Trustee, Sewickley, Pa.

Producing sodium-sesqui-silicate, crystallized. No. 1,948,730. G. W. Morey, Md., to Phila. Quartz Co., Philadelphia.

The approximate separation of solid and liquid fatty acids. No. 1,948,683. E. Schlenker, Berlin.

Solvent purification of stearic acid etc. No. 1,948,585. S. Jozsa, N. Y., to Standard Brands, Dover, Del.

Gelatinous dynamite explosive for deep holes. No. 1,948,583. J. M. Jeffries, to Atlas Powder Co., Wilmington, Del.

Diphenylamine-arsenic trichloride preservative for wood. No. 1,948,551. H. W. Walker, to Penn. Lubricating Co., Del.

The production of oxalic acid. No. 1,948,441. H. C. Duus, to du Pont Co., Wilmington, Del.

Mfr. of benzoic anhydride. No. 1,948,342. M. N. Dvornikoff, to Monsanto Chem. Co., St. Louis.

Dispersing agents from sulfonating derivatives of montane. No. 1,948,299. M. Jahrstorfer & H. G. Hummel, to I. G., Frankfort, Germany.

Production of alkyl phenols. No. 1,948,287. Hyym E. Buc. & R. Schuler, N. J., to Standard Oil Dev. Co., Wilmington, Del.

Secondary alcohols from acid liquors of olefines and $H_2SO_4$. No. 1,948,286. B. T. Brooks, to Standard Alcohol Co., Wilmington, Del.

Solid, stable sodium ethyl oxalacetate. No. 1,948,201. R. M. Carter & W. L. Johnson, Balto., to U. S. Industrial Alcohol Co., N. Y. City.

Composition, derived from oily mixture of hydrocarbons by oxidation. No. 1,948,161. W. P. Bitler, to C. P. Byrnes, Trustee, Sewickley, Pa.

Mfr. of chromates, roasting with alkali base. No. 1,948,143. O. F. Tarr, Md., to Mutual Chem. Co. of Amer., N. Y. City.

Bauxite-sulfuric acid-heat, to yield sulfate of ammonia. No. 1,948,004. R. S. Perry, Ga., to Paper Makers Chem. Corp., Kalamazoo, Mich.

Metal carbamates-ammonia and $CO_2$ on soluble metal salt. No. 1,948,002. A. Mittasch & P. Chall, to I. G., Frankfort, Germany.

Condensation products of dimethylolureas. No. 1,947,997. Martin Luther, to I. G., Frankfort, Germany.

Aqueous iron hydroxide to remove sulfur and sulfuretted ammonia from gases. No. 1,947,983. Gluud, Brodkorb & Klempt, to Gess. fur Kohlentechnik, Germany.

Mfr. of aliphatic anhydrides. No. 1,947,977. Henry Dreyfus, London.

Acidyl polyalkylene polyamines. No. 1,947,951. Neelmeier, Nocken & Friedrich, Ger., to Gen. Anil. W'ks, N. Y. City.

Copper oxide-ammonia cellulose solutions. No. 1,947,939. E. Hubert & K. Weisbrod, to I. G., Frankfort, Germany.

Catalyst, of chromium oxide impregnated pozzuolane, for making $HNO_3$. No. 1,947,864. L. J. A. Marmier, Lille, France.

For conducting caustic alkali fusions. No. 1,947,852. J. E. Jewett, Buffalo, to Nat. Anil. & Chem. Co., N. Y. City.

By-product of oxide of carbon to methanol, as agent to suppress foaming of aqueous solutions. No. 1,947,725. A. Macarthur & A. Stewart, to Imperial Chemical Industries, England.

Reagent process on natural theobromine-containing products. No. 1,947, 717. J. H. Kellogg, G. L. Teller & W. K. Teller, to Battle Creek Food Co., Battle Creek, Mich.

Esters of sulfated higher aliphatic organic acids. No. 1,947,673. H. Bertsch, to H. Th. Bohme A. G. Chemnitz, Saxony, Germany.

Alkali and ammonia compounds with sulfur et al by-products. No. 1,947, 671. Est. F. Bartling, to Alterum Kredit A. G., Berlin.

Nitrogen derivatives of higher fatty acids. No. 1,947,650. K. Keller, Frankfort, to Gen. Anil. W'ks, N. Y. City.

Sodium cyanide from sodium calcium cyanide. No. 1,947,570. E. J. Pranke, to Grangers Mfg. Co., Boston.

Mfr. and recovery of glutamic acid and its compounds. No. 1,947,563. R. Masuda & C. L. Royal, to Larrowe-Suzuki Co., Rossford, O.

Nitrated sugar explosive. No. 1,947,530. H. A. Lewis, to du Pont Co., Wilmington, Del.

The preparation of tetrachloroethylene. No. 1,947,491. J. H. Reilly, to Dow Chem. Co., Midland, Mich.

Paper copperized with copper ortho phenyl phenate. Nos. 1,947,451-2. Barber, Natwick & Phelps, to Crown Wilmette Paper Co., Cal.

Formaldehyde-bisulfite salt with modifiers, as soluble dye. No. 1,947,433. M. Mendoza, A. G. Murray & H. B. Briggs, to Imperial Chemical Industries, England.

Soda reactant, and a phosphatic, in baking powder. A. H. Fiske, to Rumford Chem. W'ks, Warren, R. I.

Cyclic oxidation of alcohols to form aliphatic acids. No. 1,951,280. Wm. J. Hale, Midland, Mich., & W. S. Haldeman, Monmouth, Ill.

Mag. carbonate on hydrated calcium sulfate, in mfre. of magnesium chloride. No. 1,951,160. R. B. McMullin, to Mathieson Alkali, N. Y. City.

Sodium stearate coating for chloramine. No. 1,950,956. W. F. Wilhelm, to Marshall Field, Chicago.

Cellulose organic ester composition, phthalic anhydride. No. 1,950,907. C. J. Staud & T. F. Murray Jr., to Eastman Kodak Co., Rochester, N. Y.

Stable hydrocyanic acid. No. 1,950,899. C. J. Marvin & Walker, Cal., to du Pont Co., Wilmington, Del.
Phthalic anhydride dehydration of a butyl alcohol. No. 1,950,889. W. W. Hartman, to Eastman Kodak Co., Rochester, N. Y.
Soda-free alumina, acid-leached. No. 1,950,883. W. H. Gitzen, to Aluminum Co. of A., Pittsburgh, Pa.
Lime, ethyl ether, hydrocyanic acid preparation of calcium cyanide. No. 1,950,879. P. J. Carlisle & C. Dangelmajer, to du Pont Co., Wilmington, Del.
Sulfur-containing derivatives of higher aliphatic hydrocarbons. No. 1,950,850. K. Keller, Gen. Anil. W'ks, N. Y. City.
For the manufacture of alkyl halides. No. 1,950,827. E. Teupel, to I. G. Frankfort, Germany.
Non-fibrous candles, 1 to 20% of aliphatic or octodecyl or cetyl alcohols. Nos. 1,950,813-4. W. Pungs & M. Jahrstorfer, to I. G., Frankfort, Germany.
Urea, thiourea or dicyanimide with formaldehyde for resin-like condensation products. No. 1,950,746. Fritz Pollak, Vienna, to Synth. Plastics Co., N. Y. City.
Mfre. of oxygenated organic compounds. No. 1,950,671. S. J. Green & R. Handley, to Celanese Corp. of Am., N. Y. City.
Sizing formulae and methods, cell. carboxylic esters, for textile et al material. No. 1,950,664. H. Dreyfus, W. A. Dickie and P. F. Coombe, to Celanese Corp. of Am., N. Y. City.
Cellulose with stannic halide, to form esters. No. 1,950,663. H. Dreyfus, London.
Phenoplastic, sodium phenate and methylene dichloride. No. 1,950,516. C. F. Prutton, to Dow Chem. Co., Midland, Mich.
Urea and biurette reagent in making glue. No. 1,950,483. E. F. Christopher and F. L. De Beukelaer, to Swift & Co., Chicago.
Aryl and phenyl radicals, to increase resistance of vulcanized rubber. No. 1,950,478. W. S. Calcott & W. A. Douglass, to du Pont Co., Wilmington, Del.
Under-gellation in preparation of polymer of butadiene. No. 1,950,442. Ira Williams & H. W. Walker, to du Pont Co., Wilmington, Del.
Production of halogen butadienes. No. 1,950,441. W. H. Carothers & D. D. Coffman, to du Pont Co., Wilmington, Del.
Halogen-substituted compounds. No. 1,950,440. R. A. Jacobson, to du Pont Co., Wilmington, Del.
Sulfur and thiuramdisulfides action in polymerization of halogenated butadiene. No. 1,950,439. Carothers & Kirby, to du Pont Co., Wilmington, Del.
Polymerized halogenated hydrocarbons. No. 1,950,438. Carothers, Collins & Kirby, to du Pont Co., Wilmington, Del.
Catalytic polymerizing of chloro-butadiene. No. 1,950,437. H. W. Starkweather, to du Pont Co., Wilmington, Del.
Polymerized halogenated hydrocarbons. No. 1,950,436. Ira Williams, to du Pont Co., Wilmington, Del.
Catalytic process for preparing halogen butadienes. No. 1,950,435. A. M. Collins, to du Pont Co., Wilmington, Del.
Hydro-halogen products of acetylinic hydrocarbons. No. 1,950,434. Downing, Carter & Hutton, to du Pont Co., Wilmington, Del.
Bromo butadiene polymers. No. 1,950,433. Carothers & Collins, to du Pont Co., Wilmington, Del.
Polymers of halogenated hydrocarbons. No. 1,950,432. Carothers & Collins, to du Pont Co., Wilmington, Del.
Halogen derivative of acetylene polymers. No. 1,950,431. Carothers & Collins, to du Pont Co., Wilmington, Del.
Nonbenzonoid polymer of acetylene in impregnating porous articles. No. 1,950,430. Calcott, Carter & Downing, to du Pont Co., Wilmington, Del.
Process for treating acetylene derivatives. No. 1,950,429. W. S. Calcott & F. B. Downing, to du Pont & Co., Wilmington, Del.
Dyestuffs from cyanoacetic acid. No. 1,950,421. O. Wahl, to Gen. Anil. W'ks, N. Y. City.
Ammo. carbonate, boric acid and alcohol (ethylene glycol) in spaced metal plates as elec. condenser. No. 1,950,352. J. T. Curtis, to Curtis Cont. Corp., Cleveland.
Destructive hydrogenation of carbonaceous materials. No. 1,950,333. L. von Szeszich, Constance, Germany.
Process for high percentage per compounds; by salts and hydrogen peroxide solution. No. 1,950,320. J. Muller Weissenstein, Austria.
Heavy oil suspension of colloidal coal, then sulfactive catalyst, producing hydro. oils. No. 1,950,309. J. M. Jennings, Baton Rouge, to Standard-I.G. Co., N. Y. City.
Water-soluble substances of capillary-active properties. No. 1,950,287. L. Becker & R. Muller, to Pott & Co., Dresden, Germany.
Mfr. of solid carbon dioxide. No. 1,950,180. C. L. Jones & A. D. Small, to Am. Dryice Corp., N. Y. City.
Process for boric acid from sodium tetraborate. No. 1,950,106. E. Franke, to Landshoff & Meyer Chem. A-G., Berlin, Germany.
Cashew nut shell liquid composition. No. 1,950,085. M. T. Harvey, to Harvel Corp., N. J.
Adhesive, with spreading properties from aldehyde bisulfite compound. No. 1,950,060. G. H. Osgood, Tacoma, Wash.
Acetic acid from formaldehyde. No. 1,950,027. S. J. Green & R. Handley, England, to Celanese Corp. of Am., N. Y. City.
Nitrogenous base salt from hydrocarbon compound for ore flotation. No. 1,949,956. I. H. Derby & O. D. Cunningham, to Peter C. Reilly, Indianapolis, Ind.
Amyl derivatives of lead. No. 1,949,949. G. Alleman, to Sun Oil Co., Philadelphia.
Hydrocarbon derivatives of lead. No. 1,949,948. G. Allemann, to Sun Oil Co., Philadelphia.
Reaction solutions from copper and zinc; metallic copper; metallic iron. With various acids. Nos. 1,949,927-8-9. H. P. Corson, to Grasselli Chem. Co., Cleveland.
Metal cleaner and rust preventer. No. 1,949,921. W. K. Schweitzer, to Grasselli Chemical Co., Cleveland.
Hydrochloride of an aliphatic amine, in soft soldering flux. No. 1,949,916 H. S. McQuaid, to Grasselli Chemical Co., Cleveland.
Water-resistant alkaline silicate coating. No. 1,949,914. L. L. Larson, to Grasselli Chemical Co., Cleveland.
Anti-gum and stabilizer gasolene product. No. 1,949,896. A. P. Bjerregaard, Okla., to Gas. Antioxidant Co., Wilmington, Del.
Fire extinguisher—methylene dichloride and carbon tetrachloride, with a non-corrosive. No. 1,949,857. G. Braun, to Sartain, Schwoerer and Fassnecht, Philadelphia and N. Y. City.
Oxidation products of higher fatty acids. No. 1,949,838. K. Keller, to Gen. Anil. W'ks, N. Y. City.
Sulfoderivatives of higher fatty acids. No. 1,949,837. G. Kalischer & K. Keller, Frankfort, to Germany, Gen. Anil. W'ks, N. Y. City.
Resinous compositions, saccharides and aldehyde with 1/urea and 2/phthalic anhydride. Nos. 1,949,831-2. A. S. Ford, to Indus. Sugar Prod. Corp., N. Y. City.
Process for carboxylic acids. No. 1,949,825. G. B. Carpenter, to du Pont Co., Wilmington, Del.
Cellulose acetate film base, using methanol to prevent wrinkling. No. 1,947,419. M. Marasco, to Dupont Film Mfg. Corp., Wilmington, Del.
Liquid and gaseous amo process for refrigeration and absorbents. No. 1,947,381. G. C. Connolly & E. B. Miller, to Rec'vr Silica Gel. Corp., Baltimore, Md.
Solution caustic alkali as separant of vitamins from saponifiable oils. No. 1,947,315. W. O. Snelling, Allentown, Pa.
More basic titanium sulfate, with $H_2SO_4$ and $TiO_2$, in making titanium white. No. 1,947,226. H. W. Richter, Elizabeth, N. J.
Treating magnesium or mag. alloy surfaces with dihydrogen phosphate and acid. No. 1,947,122. E. C. Burdick & W. H. Gross, to Dow Chem. Co., Midland, Mich.
Cellulose derivative composition, on ester of halogenated fatty acid. No. 1,947,008. E. F. Izard, to du Pont Co., Wilmington, Del.
Hydrogenation of CO to methyl formate and methanol. No. 1,946,918. N. D. Scott, to du Pont & Co., Wilmington, Del.
Fibrous crystalline caustic soda. No. 1,946,863. J. W. Koenders, to Dow Chem. Co., Midland, Mich.
Method of vaporizing mercury. No. 1,946,851. J. J. Grebe, to Dow Chem. Co., Midland, Mich.
Proceeds for mfr. of acetic anhydride. No. 1,946,707. R. Meingast & M. Mugdan, to Consortium fur Elek-Chem. Ind., Berlin.
Gas action on dried cellulose acetate for low viscosity derivatives. No. 1,946,645. C. J. Staud & T. F. Murray, Jr., to Eastman Kodak Co., Rochester, N. Y.
Cellulose ester containing an ester of trichloro tertiary-butyl alcohol. No. 1,946,643. H. B. Smith, to Eastman Kodak Co., Rochester, N. Y.
Cellulose ester containing derivatives of diethylene glycol. No. 1,946,635. T. F. Murray, Jr., & W. O. Kenyon, to Eastman Kodak Co., Rochester, N. Y.
Cellulose organic esters. No. 1,946,632. C. J. Malm, to Eastman Kodak Co., Rochester, N. Y.
Copper compounds as de-sulfurant in silver anti-tarnishing material. No. 1,946,508. A. F. Thurber & R. H. Sholtz, to Oneida Community, Oneida.
The extraction of soluble gas or vapor from gaseous mixtures. No. 1,946,489. F. W. de Jahn, to J. D. Jenssen, N. Y. City.

# *New Equipment*

"New Equipment" is now presented in a different form, beginning with this issue. Manufacturers' announcements of new equipment are briefly summarized providing CHEMICAL INDUSTRIES' readers with a broad view of the month to month progress in the equipment field. For more detailed information, and as a matter of time-saving, the use of the coupon below is suggested.

An acid-proof cement and bricks (sold under the trade name "Penchlor") is available for use in constructing tanks or pipe lines to store and transport chlorine or other corrosive chemical solutions. Cement is quick setting, has a compressive strength of 2,400 lbs. and tensile strength of 350 lbs. per sq. in. It adheres to stoneware, rubber, metals, wood, concrete or glass. **QC 100**

A self-protected A C induction motor which cannot burn out is in production. It has a protective device built into the windings. Should the motor stall through overloading, become excessively hot due to poor ventilation, run on single phase, or blocked for any other reason, the protector shuts off the current and the motor is saved. Sizes ½ to 30 hp., either 2 or 3-phase and standard commercial cycles and voltages. **QC 101**

A device is available to control liquid level in tanks, condensers, receivers, and other vessels at remote distances (300 ft.). **QC 102**

Considerable interest has been shown in a small experimental kiln for temperatures up to 2,000° F. Muffle firing space measures 3½ x 3½ x 4 inches. It operates on 110 to 120 volts, AC or DC, 5¼ amps. **QC 103**

An improved new sack or package ex-car loader carries 3 power-operated conveyers mounted one above the other. Uppermost or receiving conveyer is mounted on a platform that can be moved endwise along the frame of the machine or turned around to face the other direction. Middle conveyer is fixed to the machine and the bottom conveyer can be pulled out lengthwise to reach the far end of the car being loaded. Bottom conveyer is supported by a 2-caster truck, and the receiving conveyer by a separate reversible motor. Entire machine is made of aluminum alloy metal. It will handle 2,000 sacks per hour weighing up to 140 lbs. each. **QC 104**

A new and novel piece of equipment has just been announced for drying air or gases. Without the use of chemicals, without employing rotating machinery, but by the process of adsorption and operating under the "activated alumina system" perfectly satisfactory results are obtained. Fully automatic the machine will deliver gases dried to any predetermined dewpoint below normal continuously without manual attention. **QC 105**

A new pH meter is adapted to use with glass, hydrogen, quinhydrone, or antimony electrode, and with any type of solution, including colored, very dilute, weakly buffered, oxidizing or reducing, and colloidal solutions. A null method of measurement makes accuracy of the instrument independent of the e. m. f. of the enclosed dry cell. Except in the case of the glass electrode, with which a sensitive galvanometer must be used, instrument is

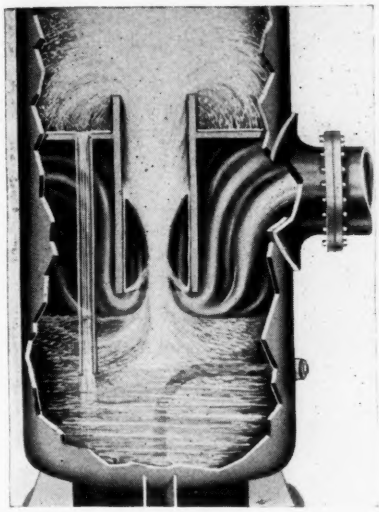

Fig. 1. Novel arrangement for intimate contact between gas and liquid.

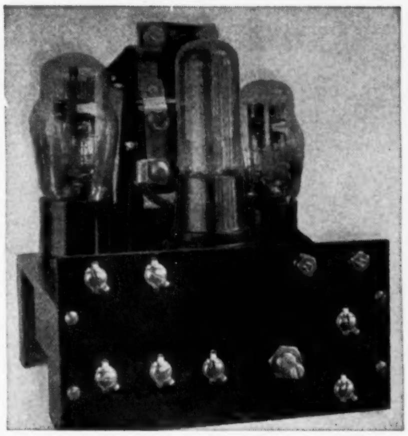

Fig. 2. Uses for this photo-electric relay include synchronizing conveyors, safety, lighting control, counting, etc.

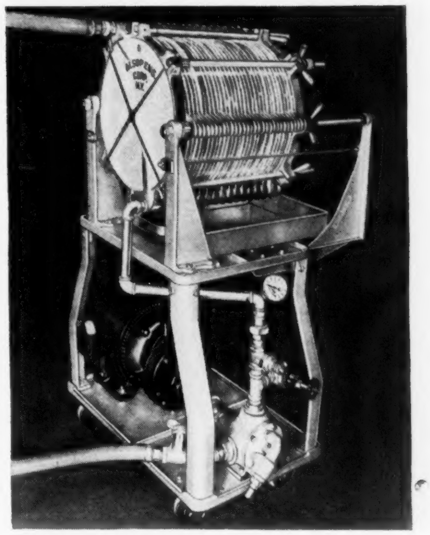

Fig 3. A filter with a number of improvements designed specially for fine chemicals, etc.

entirely self-contained, and the single panel meter is used both for balancing and reading. Two models are available, 1 with an accuracy of /-1 mv. on the 0-500 mv. scale and /-2 mv. on the 0-1000 mv. scale, and 1 with an accuracy of /-0.5 mv. and 1-1 mv. **QC 106**

A line of compact and convenient electrode assemblies for pH work, in which calomel reference cell and unknown chamber are combined in 1 piece of glassware has been announced. An especially convenient assembly is the 1 in which either glass, hydrogen, or quinhydrone electrode can be used, which requires a sample of only 2 to 10 c.c. of liquid. **QC 107**

A meter of the dial type of construction provides an easy and accurate reading on 1 instrument of hot water or low steam temperatures as well as pressures or feet of water. **QC 108**

A new wort cooler has been announced and the manufacturer claims that it will reduce refrigerating machine capacity requirements 25%. **QC 109**

A revolutionary vacuum mixing unit (1 to 1,000 gal. capacities) is finding immediate favor. Mixing under vacuum has a number of advantages in a number of fields. **QC 110**

Use of lead thread lubricant in the operation of machinery and equipment at high temperatures is an interesting recent development. While considered of minor importance, because of the small quantities used, it is important, nevertheless, that the threaded joints do not freeze or corrode together. Ordinary oils and greases disappear at the flash points of the oils of which they are made. Carbonaceous organic materials char at high temperatures and lock the threads. Non-metallic materials such as silicates and chalks become a powder. Graphites are absorbed by the iron and disappear. Lead does not harden; does not oxidize, and is not absorbed by iron when hot. New process for the production of lead of this fineness, at a moderate price, has only recently been developed. **QC 111**

A new aluminum wheelbarrow capable of holding 5 cubic feet of sand, weighs but 37 lbs. instead of 85 lbs. Is of interest in the chemical field not alone because of its light weight, but because it is resistant to corrosion and therefore is non-toxic. **QC 112**

There is a somewhat prevalent idea that rubber and gutta-percha are practically identical bodies, though this is by no means the case. Gutta-percha tubing is finding a number of uses in the chemical and allied fields where corrosion is a factor. Not being vulcanized the tubing can be bent into any shape simply by submerging in warm water. Two ends can be joined and even the diameter increased by this simple operation. **QC 113**

A new tank-type viscosity regulator has been designed for controlling viscosity of varnishes, lacquers, lubricating oils, printing inks, etc., consisting of a slowly rotating paddle within a tank, paddle being driven through a special transmission operating a dilution valve. Viscosity can be controlled within 2½% of that for which the regulator is set. **QC 114**

Where water of exceptionally high purity is desired a new water still lined with block tin has proven very satisfactory. **QC 115**

A device with a number of new advantages is now offered for use in processes where intimate contact between gas and liquid is essential. Suitable for gas and air hydration, oxidation, chlorination, aeration, etc. Fig. 1. **QC 116**

A new heat resisting aluminum paint for refractories that will withstand temperatures up to 1,500° F. without any fading is reported. It protects brick thoroughly in kilns, driers, fire boxes, furnaces, etc., where formerly, due to high temperature no paint could be successfully applied. **QC 117**

New photo-electric relay for general industrial use and much lower priced than former light operated relays of comparable reliability, has a number of interesting innovations. The heavy-duty contactor in the new relay interrupts 20 amperes, 115 volt AC non-inductive load or 3 amperes, 115 volt DC. In such applications as counting, operating speed is extremely fast, ranging from 200 to 600 objects per minute depending upon the amount of light change available and the resistance of the contacts. Operating reliability is assured since ingenious design has eliminated the use of telephone relays. Fig. 2. **QC 118**

A new ultra fine disc filter with a number of exclusive features has just been developed. Machine has an explosion-proof, ball-bearing motor with built-in gear reduction. An exclusive feature of the pump, which is constructed of stainless steel and bronze, is its oilless bearings which prevent any danger of contamination of the liquid being filtered. An automatic pressure control on the pump eliminates any necessity for having an attendant constantly watching the filter while it is operating. Machine is entirely automatic in operation. As few as 4 discs can be used, when only small quantities of liquid are to be filtered, thus making the filter adaptable for large or small batches with equal efficiency. Fig. 3. **QC 119**

**Chemical Industries,**
**25 Spruce Street,**
**New York City.**

**I would like to receive more detailed information on the following: (Kindly check those desired).**

| | | |
|---|---|---|
| QC 100 | QC 106 | QC 113 |
| " 101 | " 107 | " 114 |
| " 102 | " 108 | " 115 |
| " 103 | " 109 | " 116 |
| " 104 | " 110 | " 117 |
| " 105 | " 111 | " 118 |
| | " 112 | " 119 |

**Name**..........
**Title**..........
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**Equip. April**

# Coal Tar Chemicals

## Coal Tar Chemicals Biologically

A process for production of spirits and oils from coal by a biological process is described in English Patent 398,601. To obtain greater yields under more economical conditions than heretofore, the process calls for treatment of the material with a bacterial organic acid, and/or with fungi or enzymes developed at a later stage in the process to split up the compounds thereof, especially the hydrocarbon compounds, as a preliminary to fractional distillation in a known manner. Preferably, bacterial organic acids are employed, in particular those which owe their origin to the reactions of bacteria that are accustomed to function in the building up of the enzymes and nitrogenous compound found in plants, such as the nitrifying bacteria of the soil, and in the disintegration, putrefaction, or fermentation of nitrogenous and carbohydrate structures, such as acids produced by the action of those bacteria, cultivated in a liquid containing carbohydrate and nitrogenous compound products. Other organic acids, such as acetic, would be suitable, but an acid produced by bacteria of the genus lactici has been found most effective—for example, the acid produced by allowing a mixed dilute mash of malt and raw grain (preferably barley), first to saccharify and then to acidify at suitable temperatures between about 128°-132° F.

Finely pulverized coal is spread out to a uniform depth in a container, formed of, or lined with, acid-resisting substance, and the acid is run over and mixed with, the coal to form a "puddle" containing a mimimum of surface liquor—*e. g.*, about half a pint of acid per pound of coal,—the strength of the acid being such as to require 30 c. c. to 40 c. c. of normal sodium hydrate, using litmus as indicator, to neutralize 100 c. c. of the acid. The puddle container, which is preferably closed, is fitted with revolving arms to enable the "puddle" to be kept in motion, and with means for maintaining an even temperature of about 128°-132° F. After this treatment has been carried on for about 7 days (according, *e. g.*, to the type of material under treatment), an alkaline solution or mixture such as a mixture of chalk and water is added at the rate of about 2 to 3 quarts per pound of coal to produce a mixture which, for the time being, is at a temperature of 80° F. and a hydrogen-ion concentration in the near region of *p*H 4.5 to *p*H 5.0 as found by Sorensen's method. When the alkaline solution has been added, the mixture is allowed to remain at 80° F. with occasional stirring for about 21 days, when the coal dust residue is allowed to sink to the bottom of the container, and the surface liquor carefully drawn off and sent to another container. At this stage the drawn-off liquor will be of an oily consistency, carrying a large proportion of colloidal matter in suspension, and the process is further advanced by adding water to an extent sufficient to bring the *p*H value of the mixture to 6, and there is now added about ½ oz. of strong pressed yeast per lb. of coal, together with the same proportion of molasses—*e. g.*, about ½ oz. per lb. of coal—or other suitable nutrient medium for fermentation.

After the fermentation has proceeded to its limit, liquor is sent to fractionating stills and distilled. Residue of liquor in the still is cooled and sent to a closed container. where it is allowed to remain at ordinary temperatures until a film of fungi forms and develops on the surface. During the formation of the fungi a further chemical change takes place in the residual content from the "still," and these matters (consisting of ethers, gases, spirits, oils, ammoniacal liquor, etc.), either separate out by distillation and condensation, or as in the case of ammoniacal liquor, remain behind in the latest still residues, and can be reclaimed by known methods. After the liquors have been dealt with, it will be found that the coal dust residue is entirely smokeless, those matters that form smoke upon the heating of coal having passed away into the extractive liquors, to be dealt with for reclamation as described.—*Chemical Trade Journal*, British, Jan. 5, '34, p. 5.

## Patents—Coal Tar

Azo dyestuff and color lakes from it. No. 1,951,298. H. Wagner, to Gen. Anil. W'ks, N. Y. City.

Azo dyestuffs. No. 1,951,082. G. Bonhote & M. Schmid, to Ste Chem. Ind., Basel, Sw.

Purification of phosphoric acid. No. 1,951,077. W. H. Woodstock, to Victor Chem. Co., Chicago.

Primary disazodyestuffs. No. 1,950,952. B. Richard, to J. R. Geigy S. A., Basel, Sw.

Thiazoline dye. No. 1,950,876. L. G. S. Brooker, to Eastman Kodak Co., Rochester, N. Y.

Alkyd resinous composition. No. 1,940,468. F. Zwilgmeyer, to Nat. Anil. & Chem. Co., N. Y. City.

Catalytic oxidation of naphthalene to produce benzoic acid, phthalic anhydride and acid, etc. Gibbs and Conover vs Wohl on patent issued 11-19-18. U. S. Ct. Patent Appeals in favor Wohl.

Vat dyestuffs, dibenzanthrone. No. 1,950,366. O. Stallmann, to du Pont Co., Wilmington, Del.

Method of making carbolic acid. No. 1,950,359. R. L. Jenkins & J. E. Norris, to Swann Research Inc., Birmingham, Ala.

Anthraquinone derivative. No. 1,950,348. A. J. Wuertz, to du Pont Co., Wilmington, Del.

Dyes for fast-tinting wool. No. 1,949,801. A. Landolt, to Ste Chem. Ind., Basel, Sw.

Insecticidal mineral oil composition. No. 1,949,798. Hugh Knight, L. C. Swallen & W. J. Bannister, to Emulsoids, Inc., N. Y. City.

Sulfuric ester, anthraquinone series. No. 1,949,299. D. A. W. Fairweather & J. Thomas, to Scottish Dyes, Grangemouth, England.

Azo dye. No. 1,949,228. H. Winkeler, H. Reindel, & G. Freiherr, to Gen. Anil. W'ks, N. Y. City.

For making alpha naphthol. No. 1,949,243. W. J. Cotton, to National Aniline & Chem. Co., N. Y. City.

Dyes, bromination from dibenzanthrone series. No. 1,949,209. M. A. Kunz & K. Koeberle, to Gen. Anil. W'ks, N. Y. City.

$H_2SO_4$ on 1.4.5.8-naphthalene-tetra-carboxylic acid, and products. No. 1, 949,202. H. Gruene & W. Eckert, Ger., to Gen. Anil. W'ks, N. Y. City.

Azo dyes—red, violet, blue, green, black. No. 1,949,142. G. Bonhote & C. Apotheker, to Ste. Chem. Ind., Basel, Sw.

Condensation product of the pyrenquinone series. No. 1,948,926. G. Kraenzlein & H. Vollmann, to Gen. Anil. W'ks, N. Y. City.

# Fine Chemicals

## Italian Tartaric Acid Methods

Method now used at the factories, at Barletta and at Binate, of the Societa "Appula" for the manufacture of tartaric acid is a combined process possessing some of the features of the Scheele-Lowitz "neutral" method and the "Scheurer-Kestner "acid" method. By the combined method, advantages are obtained of the economy in reagents characteristic of the neutral method, and of the avoidance of unwanted fermentation as afforded by the acid process.

Dry and powdered raw material is roasted in copper vesesls under a pressure of 3 to 4 atmospheres to coagulate the pectic and albuminoid constituents. It is then treated with hydrochloric acid, and the solution obtained by decantation, filtration and washing, neutralized by calcium carbonate, the lime tartrate produced being subsequently decomposed with sulfuric. Tartaric acid is then decolorized, freed from iron, lead, arsenic, and copper, and finally crystallized. Bitartrate, which for economic reasons is always produced at the same time as tartaric acid itself, is obtained from vinasse of high bitartrate (75-80%) content. In the process advantage is taken of the differences in solubility of bitratrate in water at 15° C. and at 100° C., the figures being 4.7 and 69% respectively. With raw material containing only 25-30% of bitartrate, process is rather more complicated, and consists in transforming part of the bitartrate into Seignette salt by means of sodium carbonate, while the other part is transformed by sulfuric acid into tartaric acid. By mixing the 2 solutions thus obtained, cream of tartar is precipitated.

The "Appula" has also succeeded in solving one of the most difficult problems of the tartaric-acid industry—namely, the recovery of tartrate from the final mother liquors,—which are loaded with such impurities as phosphoric acid, alumina, oxalic acid, malic acid etc. This recovery is effected by precipitating under appropriate conditions the acid salt of potassium, using as precipitant the mother liquors of the lime tartrate which contain potassium chloride. These mother liquors, which contain from 3 to 5% of potassium chloride, are freed from pectic constituents by certain non-costly reagents. Liquors are then concentrated in multiple effect evaporators fitted with salt separators, there being finally obtained about 15,000 quintals per annum of 90-92% potassium chloride. Mother liquors from crystallization of the chloride are used to manufacture a compound fertilizer which finds a ready sale, while insoluble residues

of carbonaceous matter are used for the manufacture of the activated carbon used later in the decolorization of the tartaric acid.—E. de Bartholomaeis, *Chimie et Industrie*.

### Patents—Fine Chemicals

Levo-compounds of hydrox-phenyl-aminopropan series. No. 1,951,302 Bockmuhl & Stein, Ger., to Winthrop Chem. Co., N. Y. City.

Production of calcium butyrate. No. 1,951,250. H. G. Maister, Freising, Ger.

Process for butylcemene. No. 1,951,123. Henri Barbier, Geneva, Sw.

Iodo-substituted hydroxypyridine carboxylic acids. No. 1,950,543. M. Dohrn & P. Diedrich, to Schering-Kahlbaum A.G., Berlin.

Aromatic amine. No. 1,950,079. A. W. Campbell, to B. F. Goodrich Co., N. Y. City.

Mfr. of optically active menthols. No. 1,949,329. J. Read & W. J. Grubb, Anstruther Wester, Scotland.

Basic ether containing halogen. No. 1,949,046. M. Hartmann & H. Isler, to Soc. Chem. Ind., Basel, Sw.

Ordinary aromatic amines from reduction by means of iron and ammo. Chlorides. No. 1,948,330. W. C. Calvert, Akron, to Wingfoot Corp., Del.

Purine compounds containing Hg. No. 1,948,179. Lautenschlager, Bockmuhl & Persch, to Winthrop Chem. Co., N. Y. City.

Compounds of phenyl-aminoalcohols, hydroxylated. No. 1,948,162. Bockmuhl, Ehrhart & Stein, Ger., to Winthrop Chem. Co., N. Y. City.

Soluble paraformaldehyde from formaldehyde. No. 1,948,069. O. Fuchs & E. Naujoks, to Deutsche G. und S-S. v. Roessler, Frankfort, Germany.

N-alkylated derivatives of barbituric acid. No. 1,947,944. W. Kropp & L. Taub, Ger., to Winthrop Chem. Co., N. Y. City.

Condensation products of the benzanthrone series. No. 1,947,943. G. Kraenzlein & M. Corell to Gen. Anil. W'ks, N. Y. City.

## Solvents

British Standard Specifications have been issued for acetone, ethyl alcohol, butyl alcohol and methyl alcohol. Limits are laid down in the specifications for specific gravity, distillation, acidity, alkalinity, etc., while standard methods of test for determining these properties are included in appendices. These specifications are the first to be issued by the committee of the recently formed Chemical Division which has been actively working for the past year under the chairmanship of Dr. J. Varges Eyre preparing a comprehensive series of nationally agreed standards for solvents.

Details of the tests adopted have been arrived at as the result of much careful criticism of the available methods of analysis, particularly from the point of view of degree of accuracy and reliability. In fixing the limits, there has been close consultation and discussion between the principal users and manufacturers of the articles dealt with in the specifications. Other specifications are nearing completion for acetic acids, ether, acetates, phthalates, diacetone alcohol, hexachlorethane, etc. Copies of these new specifications (Nos. 506, Methyl Alcohol) 507, Ethyl Alcohol; 508, Normal Butyl Alcohol; and 509, Acetone (all 1933) may be obtained from the Publications Dept., British Standards Institution, 28 Victoria st., S. W.1 (2s. 2d. each, post free).

## Plant Management

Light colored paints have a direct bearing on worker efficiency, according to results of experiments being conducted in leading industrial and manufacturing plants throughout the U. S. "Clean, sanitary, well painted workshops have a wholesome effect on employes, and enable them to do better and more efficient work," according to W. H. Rastall, chief of the machinery division of the Dept. of Commerce. "Greater visibility for factory workers as a result of properly colored machines and equipment." Mr. Rastall says, "has received careful consideration from industrialists in recent years. Similar surveys are now being made with the use of paint from the standpoint of sanitation and increased production."

Dr. Henry A. Gardner, one of the country's leading paint research experts, has done considerable experimental work along these same lines. "The illumination of factories," says Dr. Gardner, "has received careful consideration in recent years. Increased output, improved workmanship, and a minimum of accidents have resulted in nearly every instance where better lighting systems have been installed."

"Wall treatment," he says, "as a means for conserving the light afforded by modern illuminants is of the greatest importance. Practical experiments show that rays from powerful lights, falling upon dark brick or stone walls, give less light to a room than rays from less powerful lights falling upon similar walls that have been painted in light colors with dust resisting, washable paints. From the standpoint of economy, it is of interest to record the fact that the monthly cost of illuminants for lighting dark-walled factories may be substantially reduced by painting the interiors in light colors."

In all manufacturing plants, it is pointed out, there are certain production assets whose merits are just beginning to receive due consideration. Lighting, air conditioning, temperature control, the possibility of windowless buildings and sound control are assuming a new importance in industry. Dr. Gardner and other experts believe that color must now be added to the list. Color in the manufacturing plant, they assert, has proved a definite physical and mental aid to the worker. The correct choice of light and contrasting background plays an important part in visual accuracy, and means better and faster work. Color has, in many factory experiments, created and improved worker morale.

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## Equipment Booklets

**E109. Aluminum Co. of America**, Pittsburgh, Pa. Aluminum News Letter for March discloses fact that aluminum hopper cars after 2 years' experimental work have shown durability and resistance to chemical corrosion.

**E110. The Allen Manufacturing Co.**, Hartford, Conn. New booklet gives engineering data on Allen Chrome Molybdenum Hollow Screws.

**E111. American Instrument Co.**, Washington, D. C. Data sheet gives details of the Acree Universal pH Meter.

**E112. Dow Chemical Co.**, Midland, Mich. Entire metal trades, even industries working in metals in smaller degree, will be glad to know of this new Dowmetal data book. It explains how this world's lightest structural metal may be fabricated by processes common in industry. A description is given of accepted shop practice. Various available forms of Dowmetal are listed and described, such as sand or die castings, extruded shapes, forgings, sheet, plate and strip. Methods of welding, riveting, forming, machining are discussed in detail, with much information on designing and finishing. This new data book is altogether the most informative and enlightening document on the uses, properties and fabrication of the lightest of all the structural metals, which is so rapidly taking an important place in manufacture.

**E113. General Electric Co.**, Schenectady, N. Y. "Improving Power Factor For Profit—G. E. Capacitors Pyranol-treated" is a 29-page booklet which treats the subject exhaustively. Because of low power-factor, hundreds of industrial plants and other users of large amounts of electric power are actually buying much more current than would be required to do the same amount of work if the power-factor were higher. Inasmuch as this can be improved easily and economically, it is needless for these users of electric power to permit such a condition of economic waste to exist year after year in their plants. This booklet is the answer.

**E114. General Electric Co.** GEQ-1520B is a 50-page catalog of electric heating units and devices together with necessary engineering data.

**E115. The Linde Air Products Co.**, 30 E. 42 st., N. Y. City. March *Oxy-Acetylene Tips* contains an interesting article on pipe-welding at the new Louisiana plant of Freeport Sulphur.

**E116. Luken Steel Co.**, Coatesville, Pa. A brand new specially well-illustrated booklet on "Lukens Nickel-Clad Steel in the Process Industries.

**E117. John Robertson Co.**, 121 Water st., Brooklyn. March *Robertson-Reminders* contains special data on high pressure pumps together with information on the general Robertson line.

**E118. Stokes & Smith**, 4900 Summerdale ave., Philadelphia. A new leaflet illustrates typical higher speed packaging machinery for fully automatic filling, sealing and tight wrapping.

**E119. Westinghouse Electric & Manufacturing**, East Pittsburgh, Pa. Three publications just issued describe the new line of fractional horsepower motors with many improvements over preceding designs.

**E120. Worthington Pump and Machinery Corp.**, Harrison, N. J. This company has released several new leaflets including a description of Type VA-2 Air Compressor Unit. Also:

**E121. Worthington Power Pumps**—vertical triplex single acting type equipped with Worthington multi-V-drive.

**E122. Modern Centrifugal Pumps**—for brewhouse and cellars.

**E123. Worthington Horizontal Single Refrigeration Compressors.**

**E124. N. J. Zinc Co.**, 160 Front st., N. Y. City. The Alloy Pot for March again contains a number of interesting examples of zinc castings employed in a wide, diversified list of industries.

**Chemical Industries,**
**25 Spruce Street,**
**New York City.**

**I would like to receive the following booklets specify by number.** ..............................

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Equip. April

# Chemical Markets & News

## Wagner Bill, Practically Outlawing Company Unions, Meets With Stiff Opposition From Industrial Leaders

Senator Wagner's Labor Bill provides the battle-ground for the inevitable struggle between the ardent advocates of a completely unionized industrial America and the "open shop". Twelve months ago framers of NIRA wrote into that measure the following provisions [Section 7-(a)]:

Every code of fair competition, agreement and license approved, prescribed or issued under this title shall contain the following conditions:

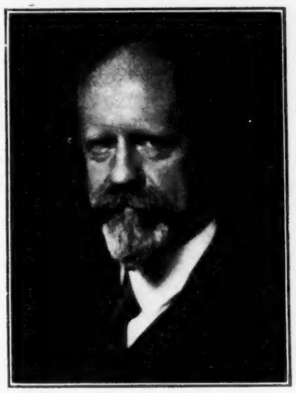
1. That employes shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint, or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection;

2. That no employe and no one seeking employment shall be required as a condition of employment to join any company union or to refrain from joining, organizing or assisting a labor organization of his own choosing.

Various interpretations were immediately placed upon this provision; organized labor and principally the American Federation of Labor saw in it a blanket endorsement of a wide, national labor movement and the end of so-called company unions; employers, on the other hand, saw no reason why a company union if satisfactory to employes should be barred.

Issue was not long in being joined. Controversal "Merit Clause" was inserted by automotive producers in their code and approved. Labor suddenly demanded that no further codes should be approved with this provision, and in this General Johnson acquiesced. For this reason the basic code of the chemical industry, submitted by the Chemical Alliance in August of last year and only approved in February, was held up indefinitely. What appeared to have been a satisfactory compromise on the wording of the "Merit Clause" has since been rejected in its entirety by Administrator Johnson, even though the Chemical Alliance Code was signed by him and later by the President, the explanation of the General being that he understood the clause previously had been removed. (Chemical Industries, Mar. '34, p. 241.).

While employers have felt that Section 7 (a) was an extremely arbitrary one that unduly favored labor with no protection to employers, labor and labor advocates have been insistantly demanding still further safeguards. Present Wagner measure is the outcome of this agitation. Said the Senator in opposing what he calls "employer-dominated unions": "They run antithetical to the very core of the New Deal philosophy." His bill would practically outlaw the company union and creates a permanent Labor Board and would make it "unfair labor practice" to "initiate, participate in, supervise or influence the formation, consititution, by-laws, other governing rules, operations, policies, or elections of any labor organization" or "to contribute financial or other material support to any labor organization, by compensating any one for services performed in behalf of any labor organization or by any other means whatsoever."



*Industry's spokesman, William B. Bell. "Bill does not aid recovery but promotes labor unrest", he tells Senate Committee.*

Industrial leaders have fought the Wagner Bill to the last ditch. "The Wagner Labor Bill flatly contradicts its declared purpose" asserted the Manufacturing Chemists' Association, through its executive committee on Mar. 22. "Far from encouraging amicable settlement of disputes, it encourages disputes. The acceptance of this bill is not to the best interest of either employee or employer. Instead of equalizing the bargaining power of the parties affected it confers upon labor unions a monopoly. With the constant assistance of the National Labor Board contemplated by this bill it would strip the employer and employee of the power to negotiate directly with each other.

"The Wagner Bill would destroy normal relationships between management and labor. Under this bill management must deal with its labor through outside agencies. The primary interest of these agencies is the maintenance of the agency itself. They disregard ability and endeavor to force promotion on the sole basis of seniority and union membership. There is no surer way to destroy all incentive to labor.

"The consequence of such legislation would be particularly dangerous to the worker and to the public if applied to the chemical industry. Because many of the operations to be performed involve questions of life and death both for those engaged in production and for the consuming public, employers in this industry have engaged labor on the basis of its skill and dependability. Employes have always been promoted on that basis and the wages paid have been considerably above those of other industries. For these and other reasons the relationship between employers and employes in this industry have been notably harmonious. The bill assumes that these two groups have nothing in common, seeks to arraign class against class, and builds up a situation that will inevitably lead to hatred and strife with attendant unemployment."

M. C. A. statement insists that cooperation through coercion can never be successful. "It is (speaking of the Wagner Bill) not a declaration of peace, but a declaration of war." This stirring press release calls attention to the apparent attempt of the framers of the bill to force labor into the A. F. of L. (although not mentioned specifically) "an organization,

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which even at its greatest height has never included more than 10% of all labor." The possible creation of a national labor union with attending dangers of monopoly are reviewed. "It will," continues the statement, "create a tyranny of labor, a tyranny exercised not by the laboring man himself, but by a small group of officers, organizers, or agitators."

Position of the chemical industry is clearly stated in the following concluding paragraph: "The time has come to talk not of more war, but of industrial peace. It would be unfair if the industrialists of the nation today did not issue a solemn warning that those who work with them should not be subjected to unnecessary, undesired and selfish coercion. The chemical industry cannot willingly submit to the destruction of the partnership between industry and labor. It will not willingly agree that the two classes whose interests are in fact identical shall be arrayed one against the other."

### Bell Goes to Washington

On Mar. 29 M. C. A. President William B. Bell journeyed to Washington to testify before the Senate Labor Committee. Said Cyanamid's president speaking as the authoritative spokesman for 200 companies with 70,000 employes: "Proposed bill would not aid recovery and would promote further unrest in labor groups." On the same day the bill was attacked by the National Industrial Conference Board, by Henry I. Harriman, president of the U. S. Chamber of Commerce, and by Nelson W. Pickering, president of the Farrell-Birmingham Co.

### An "Epochal Utterance"

Opponents have taken heart from the sudden settlement of the threatened automobile strike through the President's personal intervention. Two paragraphs of President Roosevelt's announcement appear to indicate a much different interpretation of debatable Section 7 (a) The 1st:

"The Government makes it clear that it favors no particular union or particular form of employee organization or representation. The Government's only duty is to secure absolute and uninfluenced freedom of choice without coercion, restraint or intimidation from any source."

*Printers' Ink* calls this an epochal utterance. "As years come and go, its real significance will become increasingly plain." Second paragraph that stands out in the President's memorandum:

"This is not a one-sided statute, and organizations of employers seeking to exercise their representative rights cannot at the same time be unmindful of their responsibilities."

Census of 1930 lists 48,829,920 "gainful workers." After deductions are made for executives, white-collar workers, etc., 28,269,128 may be classed as workers in the usual sense. These are divided into 3 groups; skilled, 6,282,687; semi-skilled, 7,977,572; unskilled, 14,008,869. Total employment today is estimated at about 39,000,000 "gainful workers." A. F. of L. membership is estimated at slightly over 4,000,000, a gain of 1,300,000 since NRA went into effect. Total membership in unions outside of the Federation is estimated at 1,000,000. Census of 1930 lists but 117,467 "gainful workers" in the chemical and allied industries.

## *Washington*

Majority of code authorities attending NRA's huge "round-table" discussion (March 5-7) agreed that the most crying need in administration of codes, from the standpoint of the industries themselves, is the problem of strict enforcement. NRA promised increased activity in this direction, but it is significant to point out that code authorities and NRA are limited as to how far either or both may go in enforcement. Actual enforcement work through penalization, is restricted to the Dept. of Justice, Federal Trade Commission, and the courts.

## *COMING EVENTS*

**Fashion Group, "Fashions and Interior Decorations Developed in Man-Made Materials,** 30 Rockefeller Plaza, Rockefeller Center, March 15-April 14.

**Industrial Arts Exposition, National Alliance of Art and Industry,** 30 Rockefeller Plaza, Rockefeller Center, April 1-30.

**American Drug Mfrs. Association,** Greenbrier, White Sulphur Springs, week of April 16.

**Knitting Arts Exhibition,** Commercial Museum, Phila., Apr. 23-27.

**Electrochemical Society & American Ceramic Society,** joint meeting, Asheville, N. C. April 26-28.

**U. S. Chamber of Commerce,** Washington, May 1-4.

**A. C. S.** 12th Midwest Regional Meeting, Hotel Muehlebach, Kansas City, Mo., May 3-5.

**Fourth Annual National Premium Exposition and Convention,** Palmer House, Chicago, May 7-11. A. B. Coffman, Exp., Mgr., 35 East Wacker Drive, Chicago.

**Tanners' Council of America,** Spring Meeting, Greenbrier, White Sulphur Springs, W. Va., May 10-11.

**International Petroleum Exposition,** Tulsa, Okla., May 12-19.

**American Institute of Chemical Engineers,** tentative, Waldorf Astoria, N. Y. City, May 14-21.

**National Fire Protection Association,** Atlantic City, May 14-18.

**Achema VII Exhibition of Chemical Apparatus & Plant,** Cologne, Germany, May 18-27.

**Flavoring Extract Association,** Waldorf-Astoria, N. Y. City, May 21-24.

**American Petroleum Institute,** mid-year meeting, Pittsburgh, William Penn Hotel, May 22-24.

**Canadian Chemical Association,** Royal York Hotel, Toronto, June 4-6.

**Cottonseed Products Association,** New Orleans, June 4-5.

**American Water Works Association,** Hotel Commodore, N. Y. City, B. C. Little, secretary, June 4-6.

**American Association of Cereal Chemists,** Royal York Hotel, Toronto, June 4-7.

**Ninth International Congress of Pure & Applied Science,** Madrid, Spain, June 10-17.

**National Association of Insecticide & Disinfectant Mfrs., Inc.,** Chicago, June 11-12.

**National Fertilizer Association,** 34th convention, White Sulphur Springs, June 11-13.

**American Electroplaters' Society,** Hotel Statler, Detroit, June 11-14.

**Eleventh Colloid Symposium,** Madison, Wis., June 14-16.

**National Association of Purchasing Agents,** Cleveland, June 18-21.

**American Society of Refrigerating Engineers,** semi-annual meeting, Skytop, Pa., June 21-22.

**A. S. T. M.** Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, June 25-29.

**Technical Association of the Pulp & Paper Industry,** fall meeting, Portland, Ore., Aug. 28-31.

**American Public Health Association,** Pasadena, Calif., Sept. 3-6. W. R. Walsh, Secretary, 450 7 ave., N. Y. City.

**American Trade Association Executives,** Wernersville, Pa., Sept. 9.

**American Gas Association Convention and Exhibition,** Atlantic City, Week of Oct. 29.

**National Paint, Varnish & Lacquer Association,** Annual Convention, Washington, fall of the year, date to be announced.

**LOCAL**

**American Institute of Chemists,** N. Y. Section, Chemists' Club, April 13.

**American Society of Refrigerating Engineers** April 26.

**Joint Meeting,** N. Y. Sections, 4 technical Societies, Chemists' Club, May 4.

Labor was insistant that it be given representation on code authorities with voting power. Others urged similar consumer representation. This was not done originally, for it was designed that each industry should be self-governed. What will be done along these lines, if anything, is not yet clear, although there is reason to believe that Gen. Johnson favors labor and consumer representation on code authorities, at least in an advisory capacity.

It was indicated that the open price provision of each code would be considered separately. This provision in certain codes may be withdrawn; further regulation of codes where it is allowed to remain is almost a certainty. In many divisions of the chemical field this question is of utmost importance.

NRA has reprinted and broadcast *N. Y. Daily News'* editorial (Mar. 11) showing rise in income in various industries in '33 over '32. Chemical group made $34,798,000 in '32 and $53,511,000 in year just closed. Total deficit for the 34 groups in '32 amounted to $45,802,000. The 34 groups as a whole showed a net profit of $440,643,000 in '33. Figures speak eloquently the stability of chemical industry.

Bituminous industry has gone on record as demanding an excise tax on natural gas. "We denounce", says C. B. Huntress, executive secretary, National Coal Association, "policy now being promoted by TVA and Public Works Administrator Ickes wherein hundreds of millions of the taxpayers' dollars are being diverted to developing surplus and expensive hydro-electric power, which in many instances will simply displace existing low-cost steam power, thereby increasing rather than relieving unemployment."

With the publication of January foreign trade figures Dept. of Commerce inaugurated a change in import statistics advocated for some time by leading economists and statisticians. Statistics of U. S. import trade issued in the past by the Dept. of Commerce have related to "General Imports." Beginning with January 1934 import statistics compiled by the Department show instead "Imports for Consumption."

### Trade Commission Moves Against

Federal Trade Commission has charged Morton Salt, Jefferson Island Salt, and Myles Salt with making erroneous claims and will schedule a hearing shortly.

Practices of Lindsay Light, Chicago, held to be in restraint of trade, both foreign and domestic, are ordered stopped in a formal cease and desist order issued by the Commission and made public Mar. 10. Lindsay Light is one of the largest American manufacturers of gas mantles and of certain chemicals entering into the manufacture of such mantels.

Commission held a hearing Apr. 6 in Columbus in its case against Duralith


ZINC
FOUNDED 1839
GRASSELLI
REG. U.S. PAT. OFF.

Corp., charged by the Commission with "carrying out a fraudulent sales plan in selling its product Duralith." Commission charges that the company promised to hold commercial paper of distributors until maturity and until distributors could pay for it out of resales, but instead, transferred the paper to finance companies.

## NRA—Codes

Code Authorities Committee of Consumers Goods Industries in a statement issued Mar. 22 charged political obstacles are retarding recovery. "Further substantial progress in reabsorbing the unemployed necessarily depends upon revival of capital goods industries" says the statement signed by George Mead, president Mead Corp. and but recently appointed administration member of the Chemical Industry Code Authority (Chemical Industries, Mar., p. 241); Lammot du Pont; and Roscoe Edlund, executive secretary, soap and glycerine producers' group; and a number of others not connected with the chemical field.

Statement lists specifically 3 outstanding examples of political obstacles:

"(1) Wagner bill, which implies a form of coercion on labor policy extremely disturbing to industry;

"(2) Connery bill, (the 30 hour week proposal) which threatens industry with an unbearable burden; and

"(3) Securities Act, with its extreme imposition of liabilities.

"These are leading illustrations, but they serve to describe the type of attitude on the part of political agencies which obstructs that revival of confidence which alone can give a firm foundation for revival of the capital goods industries.

"We should be remiss in our duty as a committee were we to fail to draw attention at this time to the emphasis which, in our judgment, rightly belongs upon clearing the way for confidence and for revival of the capital goods industries. The first step is removal of political obstacles and legislative threats."*

## U. S. Will Buy Only Blue Eagle

President Roosevelt has ordered that government contracts for materials shall be let only to those interests complying with codes of fair competition. Order provides that no bid will be considered unless it is accompanied by a certificate from the bidder stating that he is complying with and will continue to comply with each approved code.

## Code Notes

NRA Administrator Johnson on Mar. 24 approved codes for the perfume, cosmetic and other toilet preparations; brush manufacturing; rug chemical processing trade; Fuller's Earth producing and marketing industry. Number of codes approved now stands at 361.

*Gen. Johnson announced Apr. 3 he favored letting the NRA licensing provision lapse June 15.

**WHAT CONGRESS DID LAST MONTH**

**March**

**6.** **House Labor Committee favorably reported Connery 30-hour bill.**

**12.** **Patman $2,400,000,000 Bonus Bill passed by House, 295-125.**

**15.** **Senate Committee reported out revised Copeland Food & Drug Bill.**

**19.** **Dies Bill, providing for exchange of Agricultural exports for silver by means of trade agreements, passed by House, 257-112.**
**Bankhead Bill for compulsory control of cotton production passed by House, 251-114.**
**Tydings-McDuffie Philippine Independence Bill, passed by House by acclamation.**
**Home Owners Loan Corp., authorizing expenditure of $200,000,000 for rehabilitating, modernizing and mortgage aid passed by Senate, 40-34.**

**22.** **Philippine Independence Bill passed by Senate, 68-8.**

**28.** **Independent Offices Appropriation Bill passed by Senate despite presidential veto, 63-27.**

**29.** **Reciprocal Tariff Bill passed by House, 274-111.**

Codes for the quicksilver, talc and soapstone industries, became effective Mar. 31, printing ink on Mar. 26. Dr. M. H. Haertel, formerly Washington representative of the Hardwood Distillation Institute has opened code headquarters for the wood chemicals industry in the Albee Bldg., Washington. Code has recently been amended on several important points. Lime code board personnel has been approved by Gen. Johnson.

Code hearing for the exterminating and fumigating industry was held Mar. 12.

Although a finished code was agreed upon between NRA and code committee of the National Association of Insecticide and Disinfectant Manufacturers on Feb. 19, final approval has been held up pending further NRA study of certain clauses.

Bureau of Labor Statistics is preparing to compile figures on industrial payrolls and employment in codified industries pursuant to a new order by Gen. Johnson.

Walter Silbersack, Cincinnati; G. A. Altenborn, Chicago; I. R. Watts, Cleveland; H. F. Johnson, Jr., Racine; I. Wexler, Hoboken; J. D. Patton, Milwaukee; and F. R. Patterson, St. Louis, have been approved as the members of the code authority for the furniture and floor wax and polish industry.

Capt. H. R. Lebkicher is administration member of the code authority for the feldspar industry.

STILL UNDECIDED—WILL HE GO ALL THE WAY?

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*N. Y. Herald Tribune*

## No Case

With approval of President Roosevelt, Administrator Johnson, has dismissed complaint of Texas Mining & Smelting, Laredo, Texas, alleging that antimony regulus or metal is being imported into the U. S. on such terms or under such conditions as to render ineffective or seriously to endanger the maintenance of the President's re-employment agreement.

## Recognizable Tho Disguised

House Ways and Means Committee by a strictly party vote (15 Democrats for and 10 Republicans against) reported out on Mar. 16 the Administration's bill giving the President sweeping powers to enter into reciprocal trade agreements. On Mar. 29 the House by a vote of 274 to 111 passed the measure with but 2 amendments. It immediately was sent to the Senate and referred to the Finance Committee. Additional changes are expected before the bill is offered for floor discussion.†

As passed by the House the bill limits authority of the President to 3 years. It also contained the following clause: "Nothing in this act shall be construed to give any authority to cancel, or to reduce, in any manner, indebtedness of any foreign country to the U. S." Measure permits the President to lower or raise duties 50% in negotiating treaties without regard to the Tariff Commission; it permits the Chief Executive to "freeze" existing duties and articles on the free list, that is, to guarantee to foreign countries that during the life of any agreements into which they might enter with the U. S. no articles on the free list will be removed. Finally it retains the existing flexible tariff provision on commodities from countries which do not enter into trade pacts with us. This provision would permit the President to increase or decrease existing duties 50% upon recommendation by the Tariff Commission. President does not have authority under the bill as passed by the House to shift any article from the free to the dutiable list, or vice versa. Republican chairman of the Tariff Commission before the Ways and Means Committee did, however, suggest that this provision be added to strengthen the President's hand.

## "Silver Lining"

Madam Secretary of Labor, Miss Frances Perkins, continues to be the

†Since this is "a bill to amend Tariff Act of 1930," doors are wide open for even a complete revision of Hawley-Smoot Act.

bearer of good tidings. Between Jan. 15 and Feb. 15 373,000 workers found jobs in industry with a total payroll of $13,-500,000. Factory employment rose 6.1% and payrolls 12.6%. Automotive industry accounted for 70,000 jobs alone (now threatened along with 200,000 others with an abrupt end due to strikes involving questions of company union vs. A. F. of L.). Latter's monthly employment statement issued Mar. 27, reports that more than 350,000 were returned to work in February, and that during the 1st half of March employment continued to gain at the February rate.

Factory employment in manufacture of chemicals and related products increased 2.9% between Jan. 15 and Feb. 15, according to the records of the Bureau of Labor Statistics, and stood 32% above average for corresponding period in '33. Payroll totals in factories in chemical group industries increased 3.4% during this year's period and stood more than 33% above '33 level.

### All Set To Go

Executive committee of the Chemical Alliance has already set up a large part of the necessary machinery for future smooth operation. Officers of the Code Authority are: Chairman, William B. Bell, Cyanamid; vice-chairmen, Charles Belknap, Merrimac; Willard H. Dow, Dow Chemical; Lammot du Pont; treasurer, J. W. McLaughlin, Carbide; secretary, Warren N. Watson, M. C. A. secretary; acting code director, Howard Huston, assistant to Cyanamid's president.

*Howard Huston, Acting Code Director, inherits an "armful" of "knotty" problems*

Four committees have been named to date. Their personnel are: Statistics—George W. Merck, chairman, E. V. O'Daniel, W. H. Winans. Explanations—E. M. Allen and H. C. Haskell; Supplemental codes and overlapping codes—A. E. Pitcher, of du Pont Viscoloid, chairman, Glenn Haskell, U. S. I.; and Fred Russe, Mallinckrodt. Import Competition—H. M. Albright of U. S. Potash, chairman, Harry L. Derby and W. F. Reich.

## Personnel

Bruce Puffer, former Philadelphia American Commercial Alcohol manager, is now at N. Y. City headquarters and is succeeded by Louis Harvey, Jr. Harry E. Dunning, who just recently (October, '33) was drafted from American Commercial Alcohol's Chicago office to become general sales manager in N. Y. City, has been elected a vice-president and general manager. John J. Butler, formerly with Rossville Alcohol, is now with Industrial Chemical Sales. Company recently reopened its Mechanicsville, N. Y. alcohol plant. Chaplin Tyler has been made manager of sales development of duPont's ammonia division. Dr. J. E. T. Berliner has also been transferred from the chemical to the sales division. Arthur Musfeldt, R. & H. Chemicals Division, du Pont was transferred from N. Y. City to Cleveland.

G. A. Baker, formerly Duriron Buffalo manager, is now at Dayton general offices specializing on sales of "Duriment" and "Durco" alloy steels. Col. M. W. Smith is temporarily in charge at Buffalo.

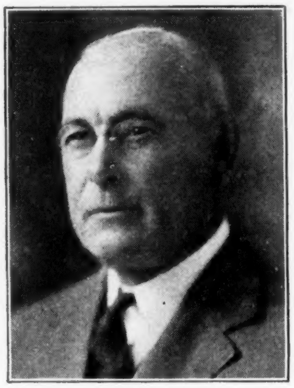
Territory served by Babcock & Wilcox's Tulsa sales office, managed by C. J. Hochenauer, has been enlarged to include Oklahoma and Southern half of Kansas.

Norman W. Drescher, Valentine's vice-president in charge of sales, has resigned. He has announced no future plans as yet.

Frederick H. Lane has joined Hercules as a consultant on protective coatings. He is also making a survey for Binney & Smith on the use of their protective coating products.

## Obituaries

Charles D. Wood, Grasselli division sales manager, Cleveland, died Mar. 20, following a brief illness.



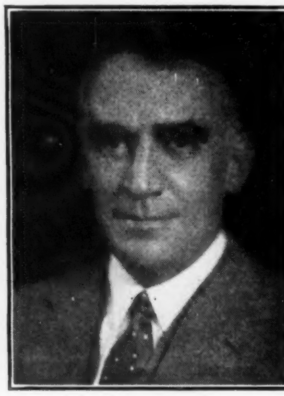
*Charles ("Charley") D. Wood, noted silicate authority, passes on suddenly*

During his 29 years of service with Grasselli, devoted essentially to the development of silicates, he was recognized as one of the best posted men in this field. In this capacity he devoted his entire energy and subsequently contributed much to the successful development of the corrugated and solid fibre box industry. His intimate knowledge of paper board and his clear vision of its potentialities formed a background that enabled him to render distinguished service in the pioneer work of an industry he served so long.

Eustace H. Gane, 69, founder of Gane & Ingram, died Mar. 23. He was chief chemist for McKesson & Robbins for 25 years before he founded G. & L. Junius Beebe, 80, Boston banker and a director of Mutual Chemical, died in the Pennsylvania Station, N. Y. City on Mar. 30. William H. Scheel, 85, founder of William H. Scheel, gums, N. Y. City, died Mar. 14. Emil C. Schumacher, 55, assistant secretary, Mac Lac-Kasebier-

*Vice-chairman Du Pont*

*Vice-chairman Dow*



*Vice-chairman Belknap*

*Treasurer McLaughlin*

**Outstanding leaders of the chemical industry chosen at recent**

Chatfield, died Mar. 12. John Barkley Eakins, 51, president, J. S. & W. R. Eakins, Brooklyn dry color manufacturer, died Mar. 14.

Fred E. Fenton, 56, Hercules Powder assistant treasurer, died March 13 at Wilmington after a long illness. He was Aetna Explosives' treasurer prior to its purchase by Hercules in '21. On Mar. 12 Frank J. McGanney, 66, retired ('31) Hercules Powder manager at Salt Lake City and one of the really beloved characters in the explosives industry. died suddenly from heart disease. Frederic B. Stevens, 78, president, Frederic B. Stevens, Inc., Detroit chemical supply house, died Mar. 1. He was very prominent in Masonic circles. Dr. John J. Squires, 53, widely known chemist and head of du Pont's personnel dept., was killed Mar. 14.

## *Foreign*

British chemical industry interest in the past month centered in the British Industries Fair (Feb. 19-Mar. 2). Number of new chemicals and several chemicals but just recently produced in the Empire featured the exposition. Titanium pigments were accorded place of honor. Pigment contains approximately 82% titanium oxide, and 18% barium sulfate. The 2 are precipitated together under special conditions. Use of titanium pigments in a number of industries beside paints is gaining in Great Britain. At present 5,000 tons are consumed as compared with 75,000 tons in U. S. Decahydronaphthalene is a powerful solvent produced by hydrogenation of naphthalene. It is cheaper than turpentine and in many cases can be used as a substitute. It is recommended for synthetic varnishes. I. C. I. displayed "Seekay" wax—a flame-resisting wax and bleaching agent. A new concentrated bleaching powder (75% available chlorine compared with 35% in normal) was featured by the same company. Products of similar nature have, of course, been produced in U. S. for some time. Another industrial item in a form new to Great Britain, but well known in U. S., is free-flowing crystalline trisodium phosphate. Outstanding demonstration was that of dyeing aluminum metal by the Gower process (operated by Messrs. Alumilite). See p. 327, this issue, for more complete details. Albright & Wilson exhibited Canadian-made sodium chlorate. This is a recent undertaking (only producer in the British Empire).

### As Competition Sees It

Bill to grant a preference to gasoline made from British coal, shale or peat has been approved by Parliament. In reality, comments British *Petroleum Times,* it is equivalent to a State subsidy of no mean order, since every gallon made for 9 years means a loss of 4d. a gal. to the Exchequer, but this is not to infer that such step is necessarily unwarranted. Secretary for Mines successfully resisted every amendment proposed. Some of these were obviously unacceptable, but others would have enabled a desirable check on development and misrepresentation to have been kept and his replies were very unconvincing. Although the speeches of the very few members of Parliament interested filled no less than 70 pages of the official reports, very much of this talk had little concrete bearing; so much was repetition centered around the labor thesis that such a new departure in industry should be developed by State rather than private enterprise. Debates showed almost a determination by many members to regard Imperial Chemical Industries' hydrogenation scheme as the alpha and omega of all British petrol-from-coal plans. Important as this is, it will not be more so than benzol recovery and low-temperature carbonization plants in the aggregate. Of course, the temptation to bait the monopolistic position of the I. C. I. was too good to be missed by those who consider that such a position must be sinister.

### Subtle Sarcasm

"It is right in principle that a home-produced product should enjoy a preference, the only question is—whether the cost of the present scheme to the British taxpayer may not prove too great in the long run. That is the question we shall await an answer. As the Secretary for Mines .claimed—the Bill may prove historic. So did the sugar-beet subsidy!"

### Profitable Potash

U. S. Potash (controlled by British Borax Consolidated) "is now in the profit-earning stage," reports Earl of Leven and Melville, Borax chairman, at annual London meeting. He further reports that contemplated large plant additions prevented declaration of dividends by U. S. Potash, but anticipates 1 in '34. Despite 40% decline in borax and boric acid prices between '28 and '32, company increased earnings in '33 for 4th sucessive year.

### NRA—Italian Style

Italian decree authorizes the Sulphur Sales Office to guarantee sulfur producers following minimum prices:

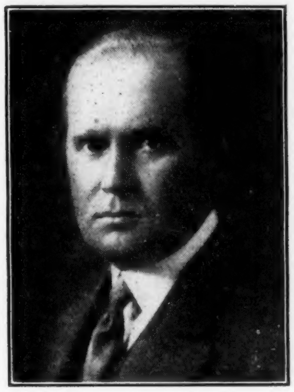
| *Grade—* | *Per ton Lire* |
|---|---|
| Superior yellow | 267 |
| Inferior yellow | 257 |
| Good | 249 |
| Ordinary (corrente) | 241 |

These sales prices cover all stocks held by producers on Dec. 11, '33, and on all sulfur produced between that date and July 31, '34. It is stated that on the above guaranteed minimum, the Sulphur Sales Office must take a loss of from lire 80 to lire 100 per ton on exports of crude.

Present stocks are estimated at about 110,000 tons, and this stock as well as the new production up to next August must be disposed of. In recent months, Italian sulfur has lost a large part of the crude sulfur export markets and, therefore, special efforts will be made to hold the markets for refined sulfur.

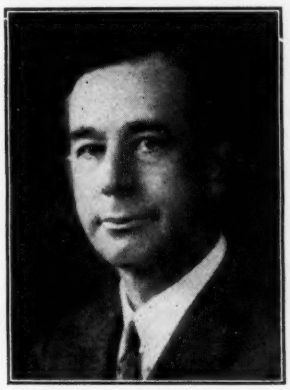
### Now Nazi Potash

Hitler has abolished Reich Potash Council (formed in '19) and has formulated drastic laws in reorganizing industry along National Socialistic principles. Main effect: to nationalize the industry further. Germany is strengthening international nitrogen position in anticipation of negotiations to renew pact which ends June 30. Gerberschaft Victor is now a German syndicate member. German Ministry of Industry, in the meantime, has issued an order prohibiting erection of nitrogen fixation plants until Jan. 30, '40; also additions to existing ones are prohibited.



*Allen—Code Explanations*

*Merck—Code Statistics*



*Pitcher—Overlapping Codes*

*Albright—Import Competition*

**Executive Committee meeting to direct Alliance matters**

German nitrogen cartel, scheduled to expire July 1, '35, has been continued to 1940, and every synthetic and by-product coke-oven nitrogen producer is now included. A 7% reduction in domestic prices has been made. Cartel operated at 35% capacity in '33.*

## *Foreign Trade*

Exercising for the 1st time the full tariff powers granted by Parliament, the French Government Mar. 16 increased many tariff rates, including those levied on certain American goods. These changes are effective at once and require no approval from Parliament until next November. Twenty-five articles are specificially mentioned; rate on chromate and bichromate of soda has been doubled. Move is viewed as the 1st offensive in an attempt to obtain reciprocal tariff advantages with other countries.

Meanwhile (Mar. 18) 15,000 workers of Southwestern France, parading behind red flags at Mont de Marsan, threatened "more drastic action" unless the Government afforded greater protection against competition of American turpentine. Recently French Government cut French naval stores subsidy from 30,000,000 francs to 12,000,000 francs. Due to exchange conditions in the past 6 months American imports have crowded French material rather badly. In the international naval stores trade Press dispatches reported American naval stores crowding out French production in France. This is, of course, not true. High tariff prevents large influx of American naval stores into France, but depreciation of the dollar has permitted American material to force out French naval stores in European and other markets where formerly France enjoyed special advantages.

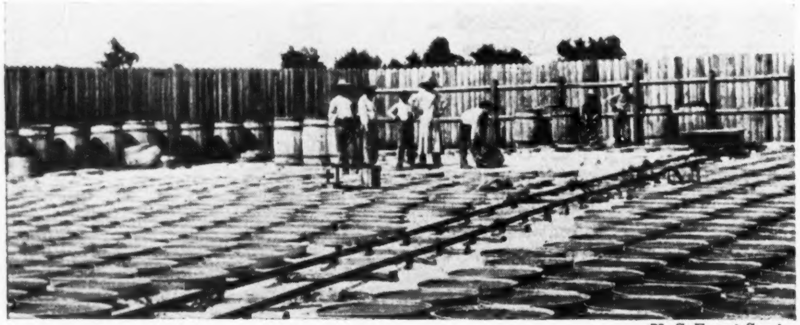
Indications that France was not alone in political tariff manouvering (possibly with an eye to the passage in this country of the administration's proposed tariff provisions) were not long in making themselves evident. On Mar. 17 Japanese consul general for the U. S., Renzo Sawada, announced that his country plans to follow the leadership of large European nations by raising or lowering duties on goods from various countries in accordance with the treatment given to Japanese goods by these nations. For the past few years Japan with a greatly depreciated yen has successfully flooded many markets and at a time when most other countries were in the throes of depression Jap factories were humming with activity. In retaliation a number of countries have raised tariff barriers or by leaving the gold standard have largely stopped the influx of Japanese goods. Industrial activity in Japan, as a result, has slowed down.

Said diplomatic Mr. Sawada: "It is Japan's notice to the world that she is at all times ready and anxious to co-operate in the true spirit of fair dealing. It is her fervent wish that she may by this program assist in the restoration of a normal balance of world trade."

### What Japan Buys

Relative U. S. position as supplier of rosin, borax, and carbon black to Japanese industry was maintained in '33; but sales of alkalies decreased, owing in part to domestic production and in part to larger amounts having been furnished by the U. K. and East Africa.

Preliminary statistics for '33 (based on the yen) showed expansion in both incoming and outgoing shipments of chemicals and allied products as compared with '32 and '31. Total chemical exports in '33 reached 75,500,000 yen ($15,200,000), and imports 155,300,000 yen ($31,200,000). Contributing to the betterment in exports were the marked gains in quantity shipments of sulfur, matches, calcium carbide, fertilizers, and coal tar dyes. Most of the individual chemicals comprising imports were received in smaller amounts than in either '32 or '31, outstanding exceptions being phosphate rock, coal tar distillates.



*U. S. Forest Service*

*A French rosin bleachery. Melted rosin from the stills is run out in a small tank car where it is poured into shallow pans for bleaching in the sun.*

### Landis Indicts

Cyanamid's Dr. Walter S. Landis indicted inflation before 100 financial and insurance company economists at a dinner meeting of the N. Y. Economic Associates on March 16. It is customary for the speaker to address the meeting before dinner is served and following it to answer, in an informal sort of way, any questions. Impatient waiters finally cleared the debris away at 11 P. M. and Dr. Landis and a large group of enthusiastic interrogators were forced to adjourn to a corner of the Cafe Savarin to carry on.

Dr. Landis, contrary to general belief, did not make his last crossing (the 65th in the series) to study the effects of inflation, but received the assignment by cable. Following his return he spoke, at the request of Cyanamid's president, William B. Bell, before a group of company employes. Stenographic notes were taken and over 40,000 copies of "An Engineer Looks At Inflation" (printed and issued by the Duke Foundation) have been distributed. Further printings are necessary to meet the incessant demand for copies. At the Economic Associates' meeting over half of the audience had previously read this brochure and several came with copies in hand. Over 10,000 reprints of Dr. Landis' article "Inflation and the Chemical Industry," appearing in CHEMICAL INDUSTRIES, Dec. '33, p. 495, have been distributed.

"We now have the 59c dollar," said Dr. Landis. There is danger that within 10 weeks we will have a 50c dollar and well-informed congressmen tell me that I am far too conservative when I prophesy a 20c dollar. They seem to hold to the opinion that a 10c dollar is ultimately more probable." Dr. Landis' audience was specially interested in the best methods of "hedging" in a period of inflation. He refused to give his personal views, but did disclose a cross-section of opinion gathered by him from the best European banking minds.

Referring to charts, the speaker showed that in France textile stocks showed up to best advantage in inflation. "A pair of stockings, dresses, coats, etc. are the middle-to-poor class's only hedge." Chemical stocks came next, for the textile industry is a huge chemical consumer. Dr. Landis reported best banking minds suggested a 4-way division—25% in small real estate in small cities or suburbs; 25% in short term bonds; 25% in high-grade common stocks of well-managed companies; 25% scattered for the sake of diversity.

Everywhere he received the utmost degree of cooperation and the files of all the large banks were at his disposal with but one injunction, that they be returned by 7 o'clock in the evening. He brought back numerous photostats of file records, annual reports of companies and compilations of insurance company records. Dr. Landis disclosed that he had been in the room in which the historic decision to take England off the gold standard had been reached, but not at that particular moment, of course.

*Additional details may be found in Special Circular 380, Dept. of Commerce, Bureau of Foreign and Domestic Commerce, Washington. Also see a Special Circular 381, same address as above.

# Associations

Each year it is customary for the dinner committee of the Drug and Chemical Section, N. Y. Board of Trade, to invite members of the press to luncheon at the Drug & Chemical Club to discuss pub-

*Postmaster James A. Farley. Over 1200 executives hear him defend the "New Deal"*

licity plans. Each year for the past several an attendance goal of 1,000 has been announced. Despite heroic efforts in the last 3 years, each succeeding committee has failed by a rather wide margin to reach this number, although advances in totals have been registered through the depression. Whether it was the better feeling attending the "New Deal," or curiosity to hear Postmaster Farley defend it, this year's affair not only reached the goal of 1,000 but established a mark of 1,198 paid admissions (at $6.50 per cover) for future committees to shoot at. With 51 on the dias and dubbed by Toastmaster Lee Bristol the "wax works," attendance totaled 1,249 exclusive of Humorist "Senator" Ford.

Mild cheers (interspersed with a few boos and crys of "Who's going to pay?") greeted Mr. Farley's prepared speech. He disclaimed the nation has gone socialistic, communistic, or is in danger of a dictatorship.

In '26 Charles L. Huisking, then section chairman, conceived the idea of a get-to-gether dinner (attendance, 226). Present section head, S. W. Fraser, was chairman of that dinner committee and Percy C. Magnus (now president of the N. Y. Board of Trade) was also a member.

Outstanding feature of the '34 dinner was the suprisingly large attendance of a representative group from the industrial chemical field. Known for a long time as primarily a drug affair, dinner now takes its place as the premiere event of the year in chemical and allied industries. Bouquets were freely distributed at the end of the splendid dinner to S. W. Fraser, "Gus" Bayer (Merck), Joseph Huisking (Charles L. Huisking), B. J. ("Gogo") Gogarty (Rossville-Commercial Solvents), and last, but not least, to efficient Ray Schlotterer, section secretary. "Oscar" and the *filet mignon* received honorable mention and the pre-dinner cocktails were voted "pure" alcohol.

### "Art To a Science"

Prof. La Mer, formally presenting Nichols Medal to Columbia's Prof. Sherman, stated that the medalist's researches had made possible a more exacting use of vitamins for medicinal purposes, and have raised its status from an art to a science with far-reaching consequences in the field of public health.

"It has been said that a body of knowledge only becomes a science when its component parts can be isolated, measured and numbers assigned to them," Prof. La Mer added. "By this criterion, the subject of vitamins was hardly a science when you entered it, for our information was at that time purely qualitative."

### In Association Circles

W. Keith McAfee, general manager, Universal Sanitary Mfg., New Castle, Pa., is the new American Ceramic Society president. "Patent Problems For The Chemist" were discussed by Clair W. Fairbanks, patent lawyer, and Lloyd Van Doren, chemist and patent attorney, at the N. Y. Section, A. I. C. meeting Mar. 16. April 9th meeting was held in conjunction with the North N. J.-A. C. S. section.

Dr. Arthur J. Norton, General Plastics, spoke at a round-table discussion of "Should Chemists Be Licensed" at recent meeting, Niagara chapter, American Institute of Chemists. National Aniline's James Ogilvie reported on compulsory system of organization built up in England.

John Mitchell, metallurgical dept., Republic Steel, Central Alloy division, Massillon, spoke before the Indianapolis chapter, American Society of Metals on Mar. 22. W. W. Leffler of the same division spoke on "Alloy Steels" before the Muncie chapter of the same society the day previously.

A. Henry Gaede, Laurel Soap, Philadelphia, spoke at a recent South Central Section, A.A.T. & C. meeting on silk degumming.

### Names In The News

Robert I. Wishnick, president, Wishnick-Tumpeer, has just returned from 1 of his periodic European trips. In the 6 weeks he was away Mr. Wishnick visited England, France, Belgium, The Netherlands and Italy.

In an interview with a CHEMICAL INDUSTRIES' reporter, Mr. Wishnick said: "Conditions in England generally are better and the public state of mind decidedly much brighter. England, true to English traditions, is "muddling through" successfully. Good sports that the English are," reports Mr. Wishnick, "they have taken our abandonment of the gold standard and the devaluation of the dollar with copious draughts of good natured philosophy."

Mr. Wishnick arrived in Paris at the height of the recent riot in the historic Place de la Concorde and it was with great difficulty that his skilled taxi driver managed to land him unscathed at the hotel entrance by taking a roundabout course through several side streets.

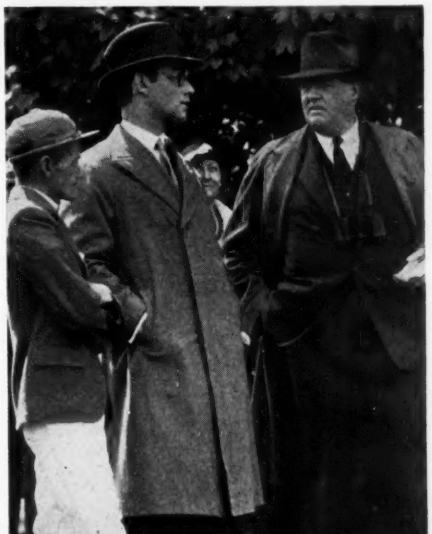
"France is facing 2 tremendously important critical situations—1 political and the other economic—with a great deal of courage and fortitude, but at the moment the answers to all the questions are still very much in 'limbo' and to hazard any opinion on the outcome is mighty risky business." War is a possibility in Europe, Mr. Wishnick believes, but the recent meeting of Dollfuss and Mussolini has helped to quiet matters down.

Russia he reports, appears to be desirous of taking away a large share of the business formerly going to Germany and would like to place it in America, if suitable trade terms can be worked out.

Mr. Wishnick was accompanied by Mrs. Wishnick. After completing his business itinerary, they enjoyed a few weeks holiday on the Riviera. (Roto. Section, this issue).

### Sulfur and Horses

Freeport Texas elected a new board chairman last month—John Hay Whitney—to succeed E. L. Norton. Still in his late "twenties," he heads 2nd largest sulfur producing company in this country. Chemical industry is particularly interested in this young man who came out



*John H. Whitney talks it over with Jockey "Buddy" Ensor and Trainer "Jim" Healey*

of Yale in '27, started in at the bottom with Lee, Higginson in order to learn practical banking and economics, and with amazing swiftness has climbed to his present position of high industrial responsibility in the short space of 5 years, 4 of them depression years.

Mr. Whitney is the grandson of William C. Whitney and a son of Payne Whitney. He went to Oxford for graduate study after leaving Yale. Like all of the Whitneys he is an outstanding sportsman. Polo, yachting, horse breeding, horse racing, flying, box hunting, dog raising are his hobbies. Of these horse breeding takes 1st place by "several lengths."*

### "Illni" Goes Ch. E.

Higher education in America has turned for the 2nd time within less than 12 months to the chemical engineering profession for outstanding executive ability. Last spring Harvard overseers reached across Harvard's famous Yard to the chemical laboratory and drafted James Bryant Conant, brilliant Grasselli and Nichols medalist and Sheldon Emery Professor of Organic Chemistry, to fill the office of president. On Mar. 16 Illinois University trustees, meeting at the Blackstone in Chicago, picked Acting Dean Arthur Cutts Williard (Ch. E., M.I.T., and famed as a heating and ventilation expert) to succeed President Harry W. Chase. Democratic, informal, new Illinois president's hobbies are simple. He has, he intimates, some revolutionary ideas how $27,000,000 university plants should be run.

## Personal

A. I. Ch. E. president, Albert E. Marshall, will speak about the huge astronomical mirror recently poured by Corning Glass, at the annual dinner of the Brooklyn Polytechnic Chemical Society on Apr. 28 at the Chemists' Club (N. Y.). Eastman Kodak's research director, Charles E. K. Mees, was among Dr. John C. Hostetters' guests at the plant when the pouring operation was undertaken. Monsanto's G. Lee Camp is just back from St. Augustine and other points South. Morris E. Leeds, president of Leeds & Northrup (Philadelphia manufacturer of electrical measuring and control devices) is now a member of the NRA Industrial Recovery Board. George W. Merck and family have returned from Palm Beach. Lammot du Pont has been elected to life membership on M. I. T. corporation board.

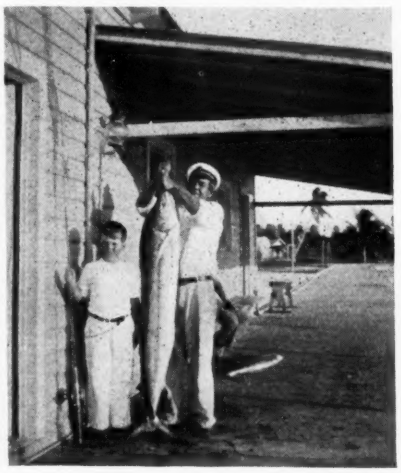
Mayor Thomas Gamble of Savannah, outstanding spokesman for the naval stores industry and publisher of the *Savannah Weekly Naval Stores Review*, was host Mar. 23 at a dinner given in honor of Williams Haynes, publisher of CHEMICAL INDUSTRIES and PLASTIC PRODUCTS. Mr. Haynes is at present on a 6 weeks' 7,000 mile trip through the South and Southwest. Those attending included Dr. H. A. Lubs, associate director, duPont's Wilmington laboratories, George F. Hasslacher, who is accompanying Mr. Haynes, Dr. T. Howard Butler of England, J. C.

*Once again demonstrates that Southern hospitality in an art. Mayor Thomas Gamble of Savannah*

Nash, O. T. McIntosh, and a number of other leaders in Savannah naval stores and fertilizer circles.

"Next few years will see the development of a great many uses from chemically treated rosins," Mr. Haynes predicted. Dr. Lubs described possibilities of chemical development of rosins as virtually unlimited.

Dr. William Weiss, Sterling Products, is recuperating from pneumonia at Palm Beach. Richard du Pont, son of Mr. and Mrs. A. Felix du Pont (Mr. A. Felix du Pont is a director in the du Pont Co.) was married recently to Miss Helena Allaire Crozer. Dr. J. V. N. Dorr sailed on the *Manhattan* Mar. 28 to be gone 5 or 6 weeks. While abroad he will attend the International Congress of Pure and Applied Chemistry in Madrid as the official delegate of the National Research Council and the A. I. Ch. E. Anthony Anable, director of publicity for the Dorr Co., is also in Europe. Liquid Carbonic's Harry L. Cook (sales manager) was recently elected 1st vice-president of the



*"A chip off the old block," Bobby Merrill, Joseph Turner's grandson, proudly displays a victory over Yankee First Baseman "Lou" Gehrig at Long Key, Fla.*

Sales Executive Club of N. Y. Medley G. B. Whelpley is no longer on the board of directors of Servel, Inc. Mr. Whelpley is still in Europe on nitrate matters. Fred E. Loud, Murray Oil Products' president, accompanied by Mrs. Loud sailed on the *Queen of Bermuda* March 27 for a greatly delayed vacation. C. P. DeLore (DeLore division, National Pigments & Chemical) and Mrs. DeLore are back in St. Louis after a West Indian cruise on the *Mauretania*. A. J. Wittenberg (Stroeck & Wittenberg) is back from Miami. Rossville's Gogarty is chairman of the committee on arrangements for the Flavoring Extract Manufacturers' Association (Waldorf, May 21-23).

Dr. Camille Dreyfus, Celanese president, arrived from Europe March 14.

### Strictly Business

Harold Fyffe (Joseph Turner) reports southern conditions much improved. J. V. Stauf, Solvay Sales, is back after an extended southern and mid-western trip. Edwin B. Newton of B. F. Goodrich's chemical staff is leaving for the Far East to make several studies on latex. He has been associated with the development of the new Anode Process for producing rubber articles directly from latex. Leo Trubeck, Franco-American Chemical Division of Penn. Sugar, and W. A. Patterson, G. W. S. Patterson (N. Y. City varnish gum importer) were in Chicago recently working with Fred A. Jensen. This well-known raw materials distributer was at Miami for a month.

## Company News

Forty years is a long time for a company to remain in 1 location. N. Y. branch of Penn Salt (Frederick G. Rodenburg, manager) moved to 9 E. 41 st. on Apr. 1. This record rivals that made by Joseph Turner & Co. at its former Cedar st. location, but now located at 42 st. and 5 ave. Ralph A. Stevenson, formerly with Great Western-Electro-Chemical, is now jobbing a complete line of chemicals used in water and sewage treatment with offices at 514 E. 8 st., Los Angeles, Calif. Solvay Sales' Philadelphia office will be located after May 1 at 12 S. 12 st.

Sharples Solvents has adopted group life insurance policy for 58 employees, workers being eligible to coverage in amounts ranging from $1,000 to $2,500. Prudential Insurance of America issued the policy, which involves a total of $73,000 and is of the contributory type. Employees share with employing company in premium payments.

According to news reports, 1,100 workers of National Aniline's Buffalo, N. Y. plant are seeking union recognition. Edgar M. Queeny, Monsanto president, mailed Apr. 2 to stockholders an impartial survey of the Fletcher-Rayburn (Stock Exchange

*Freeport Texas' sulfur sales have been running approximately 23% ahead of last year. Operations are proceeding on a satisfactory basis at the plant of the Cuban Amer. Manganese and shipments of manganese concentrate to the U. S. are scheduled to commence again 1st week in April.

Bill) prepared by the National Industrial Conference Board.

Explosion in Reilly Tar & Chemical's Newark plant, Mar. 11 resulted in death to 2 working at tar still. Theories differ on cause. Four were killed at Hercules' Kenvil, N. J. explosives plant on Mar. 8. Construction precautions prevented much greater loss of life.

William S. Murray has been elected president of Indium Corp. of America, with headquarters at Utica, N. Y. Company looks to increase commercial uses.

Technical Service Bureau, 6805 N. Clark st., Chicago, has been appointed to serve Glyco Products' accounts in Illinois, Wisconsin and Northern Indiana. Personnel of the Technical Service Bureau is under the technical supervision of Clyde A. Crowley, consulting chemist.

Ozark Barrel and Body Corp. has been formed with a plant at West Helena, Ark., and sales offices at 21E. 40 st., N. Y. City. In order to insure adequate supply of white oak for the next 50 years large tracts of timber have been secured in Mexico (present reserves of white oak in the U. S. are declining rapidly). Finished barrels will be made at Michigan Cooperage's plant at Detroit and also at Kingston, N. Y.

## *Litigation*

G. E. has started suit against Paramet Chemical, Long Island City, alleging infringement of a patent covering manufacture and sale of resins and resinous materials. Paramet has announced that it will defend the suit.

## *New Construction*

Fish Meal Corp. is planning $40,000 plant at Fernandina, Fla. Richmond Guano will rebuild Port Powhatan plant destroyed by fire. Eastern Produce (charted at Columbia, N. C., E. P. Cohoon, and others) will build a fertilizer plant. George W. Fuhr is building a $6,000 fertilizer plant at Azusa, Calif. John Wiley Jones Co., LeRoy, N. Y., will build a plant in Long Island City for the manufacture of water softeners and cleansers. Barker Sales Spray Manufacturing, Barker, N. Y., will rebuild plant recently destroyed by fire. Shell Oil, San Francisco, is said to be planning at Martinez, Calif., a $250,000 addition to its chemical plant. American Acetylene is planning an acetylene plant at McKeesport, Pa. Rohm & Haas, Philadelphia has contracted for an addition to Bristol, Pa., plant.

## *Traffic*

Proposed master code for the shipping industry (attacked at the Washington hearings by Cyanamid's traffic manager, A. D. Whittemore, speaking for the Phosphate Rock Export Association, Chemical Industries, Feb. '34, p. 145) seems destined to pass muster before NRA, despite widespread opposition of many industries. On Mar. 28 General Johnson approved in principle proposed method of rate making. Administrator's decision ended uncertainty which has been felt for some time concerning fate of the so-called stabilization provision permitting fixing of minimum tariff rates. Two days later NRA Deputy administrator, Joseph B. Weaver, in charge of marine codes, addressed the N. Y. Propellor Club and before a distinguished group of shipping representatives urged final adoption of the code.*

### Depends Upon The Viewpoint

Federal investigation of foreign trade shipping services has been ordered by Secretary of Commerce Roper. Asked for comment by the *Times*, James Sinclair, chairman, Transatlantic Freight Conference, stated: Conference lines, comprising most of the leading American and foreign flag operators, welcome the governments action. . . Principal differences now existing in the foreign trade field can be traced to the rate cutting practices of ship lines operating independent of the conference. Non-conference lines have maintained a short-sighted policy, based on a desire to obtain freight immediately without regard to the stabilization of rates.

### Actively Opposed

Hearing on proposed code for the commercial testing laboratory industry was held in Washington Mar. 23. Committee headed by Dr. William Grosvenor, Robert T. Baldwin, and others are strenuously opposing the proposed code, and are soliciting proxies among consultants. Dr. Grosvenor has issued a public statement condemning a number of provisions.

## *"Quotes"*

**Postmaster General, James A. Farley,** at the drug and chemical dinner:

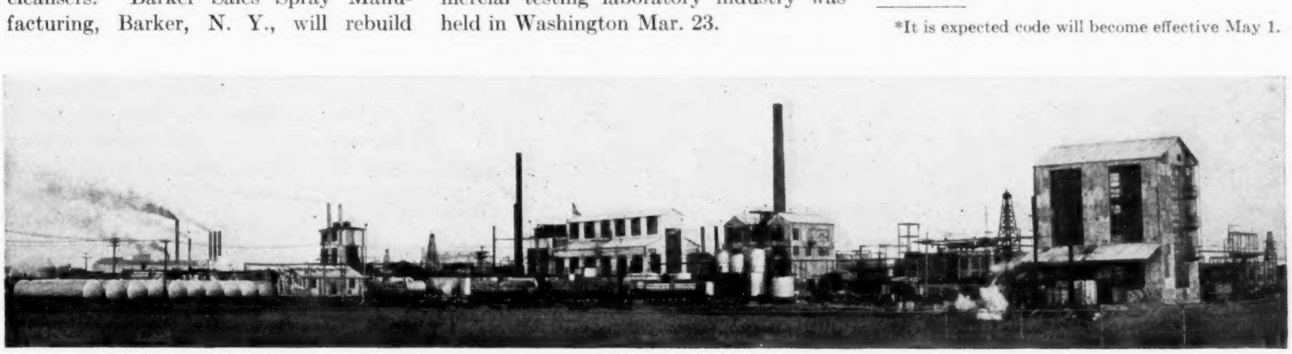
"I do not pretend to say that recovery is complete or that the recovery program is perfect. Much remains to be done and the days to come will bring with them some of the old anxieties. Yet we have come through a bitter Winter. None have starved, millions have been saved from misery. Now we are coming into the 1st Spring in 4 years that comes with promise."

**John J. Watson, president N. F. A.,** before Washington code conference:

"I would recommend that any properly organized code authority should be given power to determine all questions as soon as they are submitted. Prompt action in such matters is absolutely essential. And, finally, the interrelationship between the code authority and the NRA should be so carefully planned, so clearly defined, and so practically developed that there may be instant coordination between the 2 bodies as to any matter requiring the attention of both.

**Earl L. Smith, economist, Webber College,** speaking before the A. C. S. on chemical securities: "In conclusion, I repeat that an analysis of the principal factors affecting chemical securities shows that they answer the requirements exceptionally well for the ideal investment, that this fact has become commonly recognized by investors, and they have correspondingly bid the more attractive issues up to the very high levels. Nevertheless, I continue to hold great faith in the ability of the research worker to bring forth miracles which will still prove that the securities of the chemical industry are well worth all they are selling for."

*It is expected code will become effective May 1.



*Exclusive photograph of Sharples' new plant near Detroit. With a fast developing line of solvents particularly adaptable to lacquers Sharples' executives wisely determined to move plant from Belle, W. Va., closer to consumption points.*

# *Heavy Chemicals*

## Satisfactory, But—

Movement of chemicals into consuming industries, generally speaking, was satisfactory in March, but did not measure up to expectations of producers as the month began. Ordinarily one of the 2 best consuming months of the year, March purchasing was influenced by the serious threat of labor troubles. In certain directions possible strikes caused buyers to rush through last minute requisitions against existing contracts. This was notably so in the automotive field where the imminent possibility of labor troubles caused manufacturers to suddenly expand March schedules beyond previously planned levels. In other quarters buyers felt that wisdom dictated a policy of conservatism until such time as the troublesome labor question appeared to have reached some degree of certainty of ultimate outcome. President Roosevelt's skilful personal intervention at the 11th hour in the threatening automotive strike seemed to instill courage once again and purchasing, particularly of the spot variety, had a noticeable revival in the closing days of the month. In most lines volume compared favorably with February and in a few lines exceeded that month.

Prices continue to show great stability and changes in either direction have been relatively few and were not of special importance. Outstanding, of course, was the revision of the price schedules for both calcium arsenate and lead arsenate. New prices as announced are:—North and West, jobbers, car lots, cases, drums, tins, 5¾c to 13¾c per lb.; less car lots, 6¾c to 14¼c per lb.; dealers, car lots, 6¼c to 14¼c per lb.; less car lots, 6¾c to 14¾c per lb. South, cotton belt, jobbers, car lots, less 5 per cent, 6c to 14c per lb.; dealers, car lots, 6c to 14c per lb; less car lots, 7c to 15c per lb.

On lead arsenate revised prices are reported: Jobbers, drums, car lots, 9c to 17c per lb.; less car lots, 9½c to17½c per lb.; dealers, car lots, 9½c to 18½c per lb. and less car lots, 10½c to 19½c per lb.

Spot price of sodium hydrosulfite was advanced 1c to 21c. Contract price was quoted at 20c on quantities under 75,000 lbs. and a ½c reduction in quantities above this amount. Advance in tin caused an upward adjustment in tin salts.

## Favorable Outlook

In most quarters as the month closed a most optimistic viewpoint was taken on April and May tonnages. Beyond this point leading executives were loathe to hazard a guess pending further developments in Washington. Concensus of price opinions are decidedly bullish.

**Important Price Changes**

**ADVANCED**

| | Feb. 28 | Mar. 31 |
|---|---|---|
| Arsenic, red | $0.15 | $0.14½ |
| Magnesite | 60.00 | 55.00 |
| Sodium Hydrosulfide, spot | .21 | .20 |
| Sodium stannate | .35½ | .34 |
| Tin crystals | .40 | .38½ |
| Tin oxide | .57 | .55 |

**REDUCED**

Calcium arsenate, see report for schedule.
Lead arsenate, see report for schedule.

## Sulfur In '33

Sulfur production, shipments and exports in '33 increased largely over those for '32, with production totaling 1,406,063 long tons, as compared with 890,440 tons, being a gain of 58%; shipments 1,637,368 tons, against 1,108,852 tons, a gain of 48%; and exports amounting to 522,515 tons, as against 362,610 tons, an increase of 48% also. Production stocks at mines Dec. 31, totaled 2,799,950 tons, a decrease of 231,310 tons from the reserve at the close of '32.

New Louisiana Freeport Sulphur properties produced 17,705 tons but no shipments were made (Production started very late in '33, CHEMICAL INDUSTRIES, July, '33, p. 19). Jefferson Lake Oil produced 303,787 tons compared with but 13,401 tons in '32. Company shipped 128,916 tons in '33. Texas accounted for 77% of the total '33 production. Imports of sulfur ore amounted to 4,773 tons.

## Better Price—Higher Consumption

Carbon black producers and producers of other chemicals used in large quantities in the rubber field will find encouragement in forecast of '34 possibilities in the tire field prepared by Brookmire Economic Service. Production of cars and trucks is expected to reach 3,000,000 and may go as high as 3,500,000 as compared with '33 figures of 2,000,000. Original equipment business therefore will very probably show up favorably. Recovery in replacement sales has been slow. One reason for this relatively poor showing is that the need for 1st renewals on new cars has declined along with the slump in car sales in recent years. For example, bulk of the cars sold in '29 had their 1st shoes replaced by '32. Successive declines in car sales '30 to '32 meant corresponding declines in number of cars needing tire renewals for the 1st time. Replacement demand is expected to remain slow through '34 Better purchasing power this year may, however, boost replacement sales 10% over last.

A survey of carbon black producers discloses complete satisfaction on their part with March tonnages. Tire makers have called for large quantities and in a more limited way paint and lacquer producers have increased shipping orders. As the present year opened carbon black producers looked for April to be the peak month. Sizable shipping instructions for April are already at hand.*

## "One For Me, One For You"

Texas Gulf Sulphur will probably start sharing profits from 1 of its producing properties, Boling Dome, with Gulf Production Co., a subsidiary of Gulf Oil Co., some time in '35, a letter to stockholders from Walter H. Aldridge, president, states. It is estimated that Gulf Production's 50% share of the profits from Boling will be less than 30% of the total profits of Texas Gulf, providing relative sales and profits continue at the rate maintained from 1930 to Dec. 31, '33.

During that period about 60% of sulfur sales were made from Boling and 40% from the wholly owned deposit at Gulf, Texas. Company will continue to retain 100% of the profits from operations at Gulf (at present temporarily suspended), where there are in excess of 1,000,000 tons of sulfur on the surface and an unmined tonnage, undetermined in amount but known to be small relative to the large reserves at Boling Dome.

Report of Texas Gulf Sulphur for year ended Dec. 31, '33, certified by independent auditors, shows net income of $7,443,-613 after costs, expenses, federal taxes, etc., equivalent to $2.93 a share on 2,540,-000 no-par shares of capital stock. This compares with $5,910,492 or $2.32 a share in '32.

## Printed Optimism

**Orlando F. Weber, Allied president,** writing in annual report:

"By July the increase in sales over corresponding month of '32 had reached its peak, and a relative improvement of about 25% over '32 was substantially thereafter maintained. Dumping of certain foreign competitive commodities into the domestic market continued throughout the year in large volume.

"Financial strength remains unimpaired. Efficiency during the period of reduced operation has been especially gratifying. Company is prepared to share fully and promptly in national recovery, and directors look to company's future with continued confidence."

**Jesse J. Ricks, president, Union Carbide,** in his annual stockholders report: "There was a substantial improvement in business and an increase in earnings over the preceding year. The improvement was not confined to any particular division of the business nor to a limited group of products, but extended to practically all of the numerous commodities and articles manufactured and marketed by the corporation."

*Domestic carbon black sales in '32 totaled 161,483,000 lbs., a decline of 229,000 lbs. below '31. Approximately, 100,000,000 lbs. are consumed in the rubber field in a normal year, '26 for example see CHEMICAL MARKETS, May '33, p. 419.

**F. F. Curtze, president, Columbian Carbon,** writing in annual report:

"Tonnage movement of carbon black was largest in history of the company, being 69% ahead of '32 and 13% ahead of '29. In consequence of the increased volume of sales, accompanied by a voluntary restriction in output, inventory of carbon black was reduced 50%."

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# *Customs and Tariffs*

An interesting and rather far-reaching decision has been handed down by U. S. Customs Court in a 2 to 1 decision on mineral oil. Court decided that medicinal mineral oil has been properly classified for duty under par. 5 of the Tariff Act of 1930 under the words "all other medicinal preparations not specifically provided for." Importer S. Schwabacher brought suit to recover duties paid under this classification.

Important features of the "anti-dumping" provisions of the Emergency Tariff Act were upheld March 12 by the U. S. Circuit Court of Appeals when in a majority opinion (written by Judge Harrie B. Chase) it was held that Secretary Mellon had not exceeded his authority in requiring importers to post a bond because an extra assessment might be levied under the provisions of the act as an "extra dumping duty."

An imported mixture consisting of 92% linseed and 8% lithophone is subject to duty assessment at 4½c per lb. as a combination in chief value of linseed oil, Customs Bureau has advised collectors. Heretofore it has been the practice to classify the product as a stain at 25%, but the Bureau points out that at time of importation, it is a material for use in the manufacture of stains and is not commercially suitable of itself. Because of the change in practice, change wi'l become effective on shipments from abroad or withdrawn from bond subsequent to Apr. 15.

### Specific Rulings

**Sodium alignate—W. L. & L. D. Betz, Baltimore.** Claim was made that merchandise invoiced as seaweed partly prepared should be permitted free entry as crude or assessed at 10% as manufactured instead of at 25% as a chemical compound. Testimony showed that the seaweed was washed with acids to remove foreign matter and treated with soda ash to produce sodium alignate. An entirely new article resulted, court held, and higher duty rate was approved.

### Foreign Tariff Action

Open general licenses have been issued by British Board of Trade under provisions of the Dyestuffs (Import Regulation) Act of 1920 permitting the importation into U. K. of cresyl phosphates o-m-p and triphenyl phosphates. These products are subject to the general tariff rate of 10% ad valorem when imported from sources outside the British Empire.

Ecuador requires motor fuel to contain 20% alcohol. Government maintains a monopoly on gasoline, and decree is to aid in disposal of domestic alcohol. Germany has made lard and other oil fats government monopolies. Brazilian tariff revision is nearing completion after 2 years work. Rates, including chemicals, will generally be lower. India has reduced linseed oil rates. Chinese restrictions on exports of tungsten ore have been lifted. Denmark and Poland have entered into a trade agreement that affects chemicals in both countries. A new tax on salt imports has been added in Mexico.

Peru has reduced 25% ad valorem duty to 10% on aluminum stearate, sodium peroxide and calcium fluoride when brought in in uniform quantities of over 500 kilos, for industrial use. Rate on zinc oxide is now 10% ad valorem also. Mexican rate on sodium and potassium sulfides has been raised from 5 to 15 centavos.

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Thirty men are reported prospecting for phosphate at Franklin, Tenn. Swann Chemical's vice-president, B. G. Thrash, is reported as having leased the property.

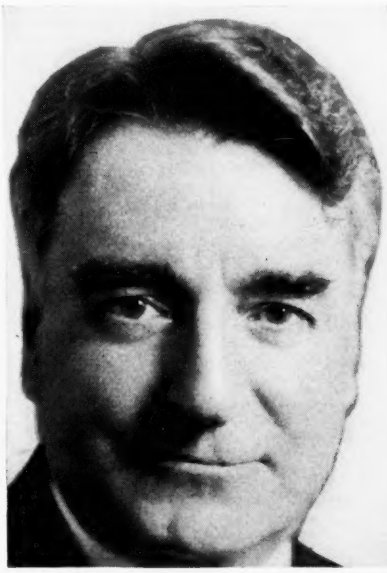
# *Fine Chemicals*

### Tartrates, Mercurials

Fine chemical market in the past month was noteworthy for the advances in tartaric acid and its salts and in the upward revision in mercurials caused by the rise in the metal. Stocks of quicksilver are said to be quite low and any sudden demand is likely, it is reported, to send prices up to still higher levels. Glycerine continues to maintain a firm position in the absence of anything resembling severe competition. Stocks, too, are rather small, although soap producers have stepped up production considerably in the last 30 to 60 days. Only important decline reported was a very sharp one in potash iodide. With less fluctuation in the dollar prices of imported items have shown stability.

### Pass a Bill

Washington believes Copeland Food and Drug Bill (with amendments agreed to by



*"I agree with statements that this bill is not perfect, legislation seldom is"*

the Senator) will not pass this session, but that the more drastic Tugwell proposals will be brought forward in the January session following a nation-wide campaign for additional support this summer.*

**Important Price Changes**

| ADVANCED | Feb. 28 | Mar. 31 |
|---|---|---|
| Acid Tartaric | $0.26 | $0.25 |
| Acetamide, C. P. | .75 | .95 |
| Corrosive sublimate | .88 | .82 |
| Cream of Tartar, cry. | .18¾ | .18 |
| Glycerine, C. P. | .12½ | .12 |
| Mercury, bisulfate | 1.33 | 1.23 |
| Cyanide, cry | 2.53 | |
| Nitrate | 1.76 | |
| Oleate | 1.34 | |
| Oxide, yellow U.S.P. | 1.64 | 1.54 |
| Red, U.S.P. | 1.44 | 1.34 |
| Salicylate | 2.51 | 2.32 |
| With Chalk | .75 | .69 |
| Mercury, metal | 76.00 | 74.00 |
| Rochelle Salt | .14¼ | .12½ |
| Seidlitz Mixture | .11½ | .10¾ |
| REDUCED | | |
| Potassium iodide | $1.75 | $2.70 |

### A Drug Viewpoint

Commenting editorially in a somewhat similar vein *The Drug and Cosmetic Industry* states: "Unless manufacturers of drugs and cosmetics see to it that a new Food, Drug and Cosmetic Act is passed at the present session of Congress, the situation will only become more involved as this goes on and a public demand for revision of the act will finally demand a much more radical act than is in the interest of the public or the trade. Those long-headed individuals who are close to the situation are trying their utmost to have the Administration accept a fair and equitable measure rather than let the whole matter die at this time."

### In Senate's Hands

Revised Copeland Food and Drug Act was reported out on March 15 by the Senate Committee on Commerce. Chief among the changes is deferment of enforcement for a year after passage. Certain of the more radical advertising provisions have been removed also.

*Contrary to general belief Senator Copeland did not desire to sponsor this legislation but was requested to do so by the Dept. of Agriculture. He found it as prepared unsatisfactory and has steered a middle course through the hearings and subsequent bill revisions. Proposed revision will in opinion of the Senator "wipe out the unworthy, hole in the wall manufacturers who have been sniping at the trade of the legitimate interests."

Latest report is that soaps may be exempted from bill.

# Paints, Lacquers and Varnish

## Retail Demand Improves

*Oil, Paint, and Chemical Review*, Chicago, estimates retailers' paint, varnish and lacquer sales have increased so far this year between 20 and 25%, with each succeeding week showing greater improvement. February sales were ahead of January by 20% with cheaper grades of material in most demand. Price level of paints to the consumer has advanced approximately 20% above the same period a year ago. These figures are encouraging. It is significant to remember points out this Journal that, "Entering '33 at a level 40% under that of '31 and 25% below that of '32, sales of paints, varnish, and lacquer by the 586 manufacturers reporting to the Census Bureau, rose above the comparative '32 total in May and by December had surpassed '31 levels by nearly $3,000,000."

The home modernization program soon to be started under the National Emergency Council is expected to place an additional $1,000,000,000 in circulation. In addition, the PWA is expected to provide a greatly improved outlet for paint, varnish and lacquer sales. The Clean-Up, Paint-Up Bureau, feeling that the tremendous backlog of purchasing is now ready to come out of hiding, has prepared a most ambitious program of activity.

Unfortunately there was a decrease of 9.3% in the number and 2% in the estimated cost of buildings for which permits were issued in February compared with January, according to reports received by the Bureau of Labor Statistics. These reports cover 772 identical cities with a population of 10,000 or over. Value of new residential buildings for which permits were issued increased by 12.6%. Number of such buildings decreased by 3.5%. New non-residential building permits decreased 24.9% in number but only 1.7% in estimated cost. Additions, alterations, and repairs to existing buildings decreased 5.9% in number and 8.2% in estimated value.

Comparing permits issued in February with those of a year ago there was a decrease of 16.5% in number and a decrease of 32% in the estimated cost of new residential buildings. Over the 12 month period new non-residential buildings decreased 25.4% in number but increased 19.5% in estimated value.

Total building contracts reported by F. W. Dodge Corp. for 37 states in February totaled only $96,716,000 against $186,463,000 in January, '34, but showed an increase over last year's February figure of $52,712,000, (a gain of 83%).*

Lacquer sales were heavy in March. Threat of a serious strike forced automotive producers to rush production. It is thought that over 300,000 units were turned out.

*March figures show public construction up 100% and private up 70%.

| Important Price Changes | | |
|---|---|---|
| ADVANCED | | |
| | Feb. 28 | Mar. 31 |
| Casein, dom. | $0.12½ | $0.12 |
| Mercury oxides, tech. | | |
| Red | 1.27 | 1.17 |
| Yellow | 1.30 | 1.20 |
| Vermillion | 1.60 | 1.52 |
| DECLINED | | |
| None | | |

Call for raw materials expanded in March over February. Specially heavy demand was reported for zinc oxide as consumers rushed to stock ahead against the rise placed in effect Mar. 31. Varnish gums turned lower, as replacement prices sagged in primary markets. Generally speaking 1st quarter prices were carried into the 2nd quarter without change. Mercury materials were up sharply as the quotations in quicksilver continued to advance steadily. Outlook for seasonal expansion in paint, varnish and lacquer manufacturing operations is viewed with optimism in most quarters, although it is expected that some falling off in April automotive schedules can be expected.


*Cover with stirrer attached which aroused considerable interest at recent Packaging Show at the Astor in New York City.*

## "Here and There"

E. A. Bradley, well-known in Pacific Coast paint circles, has formed "E. A. B." Paint Co. at Los Angeles. Sherwin-Williams' had 500 out on strike Mar. 19. Said Vice-President H. J. Hain: "We realize that as soon as the 36-hour week goes into effect we must make another general advance."†

## Paint Association News

S.-W.'s research director, Dr. C. D. Holley, spoke on paint troubles Mar. 5 before the Chicago Paint & Varnish Club. W. F. Fenton, who succeeded to the presidency on the death of President Seder, presided. C. A. Klebsattel, Advance Solvents & Chemical, will speak at the April meeting. A National Retailer's Association has been launched with Leo E. Schroeder, George E. Watson Co., Chicago, as president. N. P. V. & L. A. is cooperating. Arthur F. Winstel, president, Saeger-Winstel, Cincinnati, was elected president of the National Wholesale Paint Association recently.

Bakelite's Robert J. Moore and Mellon Institute's Dr. E. R. Weidlein were speakers Mar. 15 at a joint meeting of the N. Y. Paint, Varnish and Lacquer Association and the N. Y. Paint and Varnish Production Club held at the Biltmore. Beck, Koller's A. Hovey is a

†Settled by a 5% increase.

## January Paint, Varnish and Lacquer Sales

Sales of paint, varnish and lacquer products in January totaled $20,643,659 in value, against $16,156,062 in Dec. '33, and $11,275,396 in Jan. '33, (586 establishments). January's sales were the largest of any month since last July. Classified sales (by 344 establishments) indicated that $6,015,030 was sold through industrial channels and $7,470,517 through trade channels.

| | Total sales reported by 586 establishments | Classified sales reported by 344 establishments — Industrial sales: Total | Industrial sales: Paint and varnish | Industrial sales: Lacquer | Trade sales of paint, varnish and varnish | Unclassified sales reported by 242 establishments |
|---|---|---|---|---|---|---|
| 1934—January | $20,643,659 | $6,015,030 | $4,290,923 | $1,724,107 | $7,470,517 | $7,158,112 |
| 1933—Jan. | $11,275,396 | $3,529,886 | $2,386,947 | $1,142,939 | $4,168,260 | $3,577,250 |
| Feb. | 11,665,734 | 3,423,033 | 2,445,378 | 977,655 | 4,771,706 | 3,470,995 |
| March | 13,578,568 | 3,391,947 | 2,484,550 | 907,397 | 5,788,213 | 4,398,408 |
| April | 19,043,787 | 4,677,309 | 3,143,803 | 1,533,506 | 8,582,411 | 5,784,067 |
| May | 26,241,044 | 5,991,938 | 4,298,455 | 1,693,483 | 11,788,573 | 8,460,533 |
| June | 27,813,233 | 6,827,509 | 4,832,551 | 1,994,958 | 12,443,998 | 8,541,726 |
| July | 22,090,187 | 6,406,184 | 4,493,516 | 1,912,668 | 8,627,400 | 7,056,603 |
| August | 20,620,811 | 6,323,475 | 4,754,701 | 1,568,774 | 7,840,359 | 6,456,977 |
| Sept. | 19,097,803 | 5,544,686 | 3,975,917 | 1,568,769 | 7,462,113 | 6,091,004 |
| Oct. | 18,944,106 | 4,949,755 | 3,721,420 | 1,228,335 | 7,376,012 | 6,618,339 |
| Nov. | 16,234,234 | 4,656,353 | 3,466,174 | 1,190,179 | 6,566,157 | 5,011,724 |
| Dec. | 16,156,062 | 4,418,023 | 4,428,376 | 989,647 | 6,157,567 | 5,580,472 |
| Totals | $222,760,965 | $60,140,098 | $43,431,788 | $16,708,310 | $91,572,769 | $71,048,098 |
| 1932—Jan. | 15,894,506 | Comparable data not available | | | | |
| Feb. | 16,270,822 | | | | | |
| March | 19,089,005 | | | | | |
| April | 22,612,193 | | | | | |
| May | 24,981,441 | | | | | |
| June | 19,637,358 | 4,685,399 | 3,617,719 | 1,067,680 | 8,734,330 | 6,217,629 |
| July | 14,430,122 | 3,793,245 | 2,900,707 | 892,538 | 6,058,813 | 4,578,064 |
| Aug. | 16,032,441 | 3,851,028 | 3,057,096 | 793,932 | 6,918,659 | 5,262,754 |
| Sept. | 16,805,712 | 3,980,564 | 3,113,303 | 867,261 | 7,216,748 | 5,608,400 |
| Oct. | 15,592,377 | 3,996,500 | 3,036,323 | 960,177 | 6,610,011 | 4,985,866 |
| Nov. | 12,492,818 | 3,599,319 | 2,639,562 | 959,957 | 5,196,766 | 3,696,733 |
| Dec. | 9,484,520 | 3,222,770 | 2,186,706 | 1,036,064 | 3,506,715 | 2,755,035 |
| Totals | $203,323,315 | ......... | ......... | ......... | ......... | ......... |

new member of the Detroit Production Club. At the March meeting Dr. C. A. Knauss, Nuodex Products (Newark driers producer) was the guest speaker.

### Recoveries

T. J. McConnel, president, Cincinnati Paint, Oil and Lacquer Club, is back fully recovered. Ludington Patton, vice-president in charge of Pittsburgh Plate Glass' Milwaukee paint and varnish division, is recovering in Miami from a heart attack.

### Personnel

Kenneth E. Burgess, formerly Zapon's technical director, later in charge of Van Schaack's lacquer division, is now (as a result of its purchase by Ault & Wiborg) with the technical division of A. & W. J. C. Mullins has been reelected General Paint president. A. J. Manby is now with Allied Finishing Specialties, Chicago, as director in the manufacture of lacquer finishing materials. H. Dale Thieben has joined the technical staff of Rinshed-Mason, Detroit lacquer producer. E. V. Peters, St. Joseph Lead's zinc oxide sales manager, has been made a vice-president. He was one time with N. J. Zinc.

### Flax a "Basic Commodity"

AAA has added flaxseed to list of "basic commodities." Says Archer-Daniels-Midland's March 10th market letter: "Basic commodities" have in each instance been limited as to production. It has been a good many years since we raised enough flax in this country to supply our needs."

### Outlook For New Crop

Same authority points out that the remaining quotas for the present period, as established by Holland and Belgium, appear to be practically exhausted, and that under such conditions any volume of linseed oil business will be carried out with extreme difficulty and advancing costs.

In regard to new Indian crop, which usually comes to market Apr. 1, *Corn Trade News* (Feb. 23) states: "Harvesting of flax in India is making good progress in early districts of the south, late crop however needs rains. Correspondents seem convinced that a smaller yield will be gathered and perhaps exportable surplus will not exceed 8,000,000 bu. compared to nearly 14,000,000 in '33-'34."

Argentine crop total is disappointing. Latest cable estimates remaining exportable surplus (including Uruguayan crop) at 35,500,000 bu. Between March 10 and Dec. 31, '33 total Argentine exports were 37,500,000 bu.; in same period of '32—63,000,000 bu. Scarcity is self-evident from these figures.

U. S. Government's report on "Farmers' intentions to plant in '34" has been published. In regard to flaxseed this survey indicates that acreage will probably be 21½% larger than the harvested acreage in '33. As the harvested acreage last year was 1,283,000, estimate for '34 comes to 1,558,000 acres to be sown to flaxseed. This is the smallest acreage predicted since '21-'22 when we had 2 years of exceptionally low flax acreage. In '33 sown acreage was 1,755,000, but ordinarily around 3,000,000 acres have been planted annually during the past 25 years.

Government's estimate of U. S. flax sowings has produced considerable anxiety among the linseed oil industry. It is the concensus of opinion that from a consumption point of view acreage should be at least 2,500,000. However, it is doubtful whether enough seed flax could be found to plant such an acreage. Two hopeful signs past month were, 1st, signature by President Roosevelt of the Agricultural Bill carrying an appropriation of some $2,300,000 to fight grasshoppers and, 2nd, a general, though moderate snowfall throughout Minnesota and in the 2 Dakotas.

Demand for linseed meal in the U. S. and for linseed cake from European countries is light. Prices have declined rather sharply, thereby increasing crushers' expenses in producing linseed oil in this country.

Linseed oil prices were steady throughout the month as can be seen from the appended statistical data. Flaxseed prices weakened, however, in the primary centers of Minneapolis and Duluth but finished the month with net gains at Winnipeg and Buenos Aires.

Data compiled by the Flax Institute show following production, consumption, stocks, imports and exports of linseed oil for 4th quarter of '33:—

| | *Gallons* |
|---|---|
| Stocks, Sept. 30, 1933 | 13,284,210 |
| Production, Oct., Nov., Dec. | 17,854,124 |
| Imports, Oct., Nov., Dec. | 678,051 |
| Total | 31,816,385 |
| Less stocks Dec. 31, 1933 | 21,029,908 |
| Consumption, Oct., Nov., Dec. | 10,786,477 |
| | *Increase* 21.25% over 1932 |
| Exports | 36,045 |

**Domestic Flaxseed Receipts by Weeks**

| *Week Ending* | *March 10* 1934 | 1933 | *March 17* 1934 | 1933 | *March 24* 1934 | 1933 | *March 31* 1934 | 1933 |
|---|---|---|---|---|---|---|---|---|
| Minneapolis cars | 31 | 12 | 29 | 10 | 23 | 22 | 11 | 23 |
| Duluth cars | 9 | 2 | 8 | 1 | 11 | 3 | 7 | 8 |
| Winnipeg cars | 3 | 9 | 0 | 20 | 0 | 31 | 2 | 75 |
| Totals to date this crop* | 3,357 | 6,980 | 3,394 | 7,011 | 3,428 | 7,067 | 3,448 | 7,173 |

*Aug. 1

**Minneapolis Linseed Oil and Meal Shipments**

| *Week Ending* | *Oil in Pounds* 1934 | 1933 | *Meal in Pounds* 1934 | 1933 |
|---|---|---|---|---|
| March 9 | 729,000 | 1,102,563 | 2,312,610 | 876,185 |
| March 16 | 599,157 | 778,665 | 1,649,277 | 1,304,780 |
| March 23 | 684,233 | 1,084,036 | 2,344,073 | 3,084,904 |
| March 30 | 437,910 | 1,235,597 | 1,825,676 | 2,571,955 |
| Totals to date | 17,683,463 | 31,158,297 | 60,810,685 | 66,083,497 |

**Flaxseed Prices in Primary Centers**

| | *Minneapolis* | | | *Duluth* | | | *Winnipeg* | | | *Buenos Aires* | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Week Ending* | *Cash* | *May* | *July* | *Cash* | *May* | *July* | *Cash* | *May* | *July* | *1934* | *1933* |
| Close Feb. 28 | 1.86 | 1.82 | 1.83½ | 1.84¼ | 1.84¼ | 1.85¼† | 1.50 | 1.52* | 1.50¾† | 1.01½ | |
| March 9 | 1.82½ | 1.78½ | 1.80½ | 1.82 | 1.82 | 1.83 | 1.50½ | 1.52½ | 1.50¾ | 1.01⅝ | .59⅞ |
| March 16 | 1.79¼ | 1.75¼ | 1.78¼ | 1.79¾ | 1.79¾ | 1.79¾ | 1.48¾ | 1.50¾ | 1.49¾ | 1.06¼ | .61¼ |
| March 23 | 1.78¾ | 1.74¾ | 1.77¼ | 1.75½ | 1.75½ | 1.75½ | 1.47¼ | 1.49¼ | 1.48 | 1.05½ | .58⅝ |
| March 30 | 1.78 | 1.74 | 1.76¼ | 1.76½ | 1.76¼ | 1.76¼ | 1.50⅛ | 1.51⅝ | 1.50½ | 1.04¾ | .57⅜ |
| Close Mar. 31 | 1.76¾ | 1.72¾* | 1.74¾* | 1.75¾ | 1.75¾* | 1.76¼† | 1.53⅜ | 1.54⅜ | 1.55 | | |
| Net gain or loss | -.09¼ | -.09¼ | -.08¾ | -.09½ | -.09½ | -.09 | +.03⅜ | +.02⅜ | +.04¼ | +.03¼ | |

†Asked; *Bid.

**Linseed Oil Prices, Minneapolis, London, San Francisco & Chicago**

| | *Minneapolis* | | *London Weekly High-Low** | | *San Francisco* | | *Chicago* | | *N. Y. City* | |
|---|---|---|---|---|---|---|---|---|---|---|
| *Week Ending* | *Carlots* | *Tanks* | *High* | *Low* | *Carlots* | *Tanks* | *Carlots* | *Tanks* | *Carlots* | *Tanks* |
| Close Feb. 28 | 9.5c | 8.9c | 18s 4½d | | 9.6c | 9.0c | 9.5c | 8.9c | 9.3c | 8.7c |
| Mar. 9 | 9.5 | 8.9 | 18s 10½d | 18s | 9.8 | 9.2 | 9.5 | 8.9 | 9.3 | 8.7 |
| Mar. 16 | 9.5 | 8.9 | 18s 10½d | 18s 9d | 9.8 | 9.2 | 9.3 | 8.7 | 9.3 | 8.7 |
| Mar. 23 | 9.5 | 8.9 | 18s 9d | 18s 4½d | 9.8 | 9.2 | 9.5 | 8.9 | 9.3 | 8.7 |
| Mar. 30 | 9.5 | 8.9 | 18s 3d | 17s 7½d | 9.7 | 9.1 | 9.5 | 8.8 | 9.3 | 8.7 |
| Mar. 31 | 9.5 | 8.9 | 17s 7½d | | 9.7 | 9.1 | 9.5 | 8.8 | 9.3 | 8.7 |
| Gain or loss for month | ... | ... | —9d | | +.1 | +.1 | ... | —.1 | ... | ... |

*Per cwt.

**Indian and Buenos Aires Flaxseed Shipments, Stocks**

| *Week Ending (Indian)* | *Exports in Bushels** U. K. | Cont. | Others | Total | *Same Week Last Year* U. R. | Cont. | Others | Total | *Since Apr. 1, 1933** U. K. | Cont. | Others | *Since Apr. 1, 1933** U. K. | Cont. | Others | *Total** 1934 | *Total* 1933 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mar. 9 | .. | 12 | .. | 12 | .. | 48 | 12 | 60 | 8,984 | 3,180 | 1,892 | 676 | 2,000 | 352 | 14,056 | 3,028 |
| Mar. 16 | 8 | 28 | 44 | 80 | 12 | 36 | .. | 48 | 8,992 | 3,208 | 1,936 | 688 | 2,036 | 352 | 14,136 | 3,076 |
| Mar. 23 | 16 | 4 | .. | 20 | .. | .. | .. | .. | 9,008 | 3,212 | 1,936 | 688 | 2,036 | 352 | 14,156 | 3,076 |
| Mar. 30 | 72 | 44 | .. | 116 | 36 | 27 | .. | 63 | 9,080 | 3,256 | 1,936 | 724 | 2,063 | 352 | 14,272 | 3,139 |

*000 onitted.

| *Week Ending (Buenos Aires)* | U. S. | *Exports in Bushels** U. K. | Cont. | Orders | Others | *Total* 1934 | Same Week '33 | *Since January 1** U. S. | U. K. | Cont. | Orders | Others | *Total* 1934 | 1933 | *Visible Supply* 1934 | 1933 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mar. 9 | 20 | 55 | 394 | 657 | 8 | 1,134 | 1,866 | 2,595 | 220 | 4,981 | 9,441 | 96 | 17,533 | 17,648 | 6,693 | 6,299 |
| Mar. 16 | 177 | .. | 669 | 1,004 | ... | 1,850 | 2,039 | 2,772 | 220 | 5,650 | 10,495 | 96 | 19,183 | 11,001 | 7,087 | 6,693 |
| Mar. 23 | 209 | .. | 610 | 921 | 55 | 1,795 | 1,519 | 2,981 | 220 | 6,260 | 11,366 | 151 | 20,978 | 21,206 | 7,087 | 5,906 |
| Mar. 30 | 303 | 51 | 524 | 394 | 299 | 1,571 | 697 | 3,284 | 271 | 6,784 | 11,760 | 450 | 22,549 | 21,903 | 7,283 | 7,087 |

*000 omitted.

# *Gums, Waxes, Shellac*

### Replacement Costs "Up's" Market

Wax market turned decidedly bullish in the past 4 weeks and important advances were registered in a number of items. Buying, while conservative, was in sufficient volume to cause dealers to look into replacement costs, and upon ascertaining that higher levels were asked for in the primary markets, promptly translated this information into higher spot quotations.

### Gums Irregular

Movement in gums was erratic, some important items going into higher levels while others weakened in the face of lessened demand caused by the general uncertainty surrounding business for 10 days or more during which time the labor situation in the automotive industry looked most threatening. With the air somewhat clearer as a result of the President's terms of settlement buyers again became more active. On arabic N. Y. dealers have adopted a new schedule: 75 to 100 bags, 8⅜c per lb.; 51 to 75 bags, 8½c; 25 to 50 bags, 8⅝c ; 10 to 24 bags, 8¾c; 5 to 9 bags, 8⅞c; and 1 to 4 bags, 9c. No. 1 white sorts were higher at 18½c per lb.; No. 2, 17½c; powdered, 13c to 14½c.

Prices were also raised on Tragacanth and the new schedule is: No. 1, $1.15 to $1.20 per lb.; No. 2, $1.05 to $1.10; No. 3, 95c to $1; No. 4, 85c to 90c; No. 5, 75c to 80c.

### Watchful Waiting

Shellac market was dull throughout the past month. Buyers early adopted a "hand-to-mouth" policy of purchasing for future needs. An active demand for shipments against existing contracts was reported. This, of course, was easily explained when contract prices are compared with existing London and Calcutta markets. Bookings for the 2nd quarter have been disappointing to date. In certain quarters it is felt that present London prices have been forced up artificially and with the new crop about ready that the future course of prices is quite uncertain. Many houses are bearish for this reason. No price changes were reported here, and movement in primary centers was within very narrow limits.

**Important Gum Price Changes**

| ADVANCED | Feb. 28 | Mar. 31 |
|---|---|---|
| Arabic, amber sorts | $0.08⅜ | $0.08¼ |
| White, No. 1 | .18½ | .17 |
| No. 2 | .17½ | .16 |
| Gamboge, pipe | .60 | .57 |
| powdered | .70 | .67 |
| Tragacanth, No. 1 | 1.15 | 1.00 |
| No. 2 | 1.05 | .90 |
| No. 3 | .95 | .80 |
| No. 4 | .85 | .70 |
| No. 5 | .75 | .60 |
| **REDUCED** | | |
| Copal, Manila, loba B. | $0.11¼ | $0.11¾ |
| loba C. | .10¾ | .11½ |
| Dammar Batavia, all grades ½-1c per lb. | | |
| Singapore, all grades, ½-¾c per lb. | | |
| Elemi, No. 1 | .09¾ | .10½ |

**Important Wax Price Changes**

| ADVANCED Waxes | | |
|---|---|---|
| Beeswax, yellow | $0.21 | $0.16 |
| Candelilla | .13¾ | .12 |
| Carnauba, Flor | .37 | .36 |
| No. 1 yellow | .35 | .34 |
| No. 3 N. C. | .20 | .19½ |
| No. 3 chalky | .20 | .19½ |
| Japan | .06¾ | .06½ |
| Spermaceti, blocks | .19 | .18 |
| cases | .20 | .19 |

### New Product

Beck, Koller has an interesting new product—"Katalized Tung Oil." Literature states that it will dry with greater degree of tactfreeness and with better gloss, as well as much harder and faster, than air dry finishes made with heat-bodied linseed oil. Paint made with it has exceptionally good washable properties.

Beck, Koller has scheduled a 2-day sales conference in Detroit Apr. 13-14. All sales representatives will attend.

### Unemployment Figures

Committee on Unemployment and Relief for Chemists and Chemical Engineers reports total registration has reached 1,219. Of these 218 have been placed in permanent jobs and 232 in temporary ones. Treasurer's report shows balance of $7,416.13. Committee is considering establishment of a permanent welfare center for the profession.

# *Naval Stores*

### Quota a Surprise

Naval stores control committee (set up under AAA and with R. M. Newton, Wiggins, Miss., as chairman) working at terrific speed at Jacksonville meeting has established a permissable market quota of 381,000 units for '34-'35. Quota represents a 10% reduction from estimated production of the marketing year which ended Apr. 1. Wood rosin and turpentine, obtained by destructive distillation, are not included.

Committee voted to prorate license tags to processors on a monthly average basis that is virtually the normal rate at which the crop has been moving to the primary markets. Committee will allocate total crop through individual quotas to producers.

Decision to lower total marketing quota 10% was not expected in the N. Y. rosin-turpentine distributing trade. Owing to the fact that rosin stocks at principal points are down to around 127,000 bbls., from 244,000 bbls. a year ago, and turpentine 45,000 bbls., against 71,000 bbls., it was generally believed that the quota would either be increased or, at least, left

**Rosin-Turpentine Export Figures (April-January)**

| | Season-Rosin† | | | | Season-Turpentine | | | |
|---|---|---|---|---|---|---|---|---|
| Country | '33-'34 | '32-'33 | '31-'32 | '30-'31 | '33-'34 | '32-'33 | '31-'32 | '30-'31 |
| U. K. | 231,239 | 182,888 | 217,197 | 254,330 | 117,055 | 87,002 | 94,883 | 152,531 |
| Germany | 193,824 | 216,178 | 196,502 | 208,082 | 43,200 | 27,592 | 31,362 | 32,571 |
| Italy | 37,616 | 32,667 | 28,193 | 32,498 | 1,211 | 2,131 | 1,508 | ..... |
| Netherlands | 84,040 | 80,955 | 61,497 | 70,358 | 48,262 | 38,832 | 37,886 | 41,395 |
| Belgium | 26,520 | 20,954 | 18,273 | 24,761 | 13,179 | 9,768 | 16,126 | 25,197 |
| Norway | 10,103 | 11,332 | 8,195 | 12,369 | .... | .... | .... | .... |
| Sweden | 29,105 | 23,417 | 22,128 | 31,012 | .... | .... | .... | .... |
| S. America | 147,648 | 141,582 | 167,620 | 199,682 | 7,291 | 6,666 | 10,272 | 12,138 |
| Japan | 69,642 | 68,502 | 99,532 | 78,553 | 1,090 | 677 | 1,735 | 1,389 |
| Dutch E. I. | 64,428 | 40,357 | 41,953 | 51,729 | .... | .... | .... | .... |
| Aust. & N. Z. | 21,292 | 9,924 | 12,454 | 13,417 | 11,716 | 9,940 | 10,554 | 9,689 |
| Canada | 44,875 | 36,271 | 40,376 | 46,457 | 17,717 | 15,475 | 18,673 | 21,539 |
| Cuba | 12,993 | 12,373 | 15,975 | 15,727 | 392 | 393 | 453 | 667 |
| Europe | 631,151 | 574,378 | 562,357 | 648,462 | 227,212 | 168,404 | 182,791 | 252,867 |
| Total Outside of Europe | 403,379 | 337,758 | 409,937 | 439,644 | 42,480 | 36,971 | 46,571 | 50,004 |
| Total | 1,034,530 | 912,136 | 972,294 | 1,088,106 | 269,692 | 205,376 | 229,362 | 302,871 |

†in bbls. of 500 lbs. gum and wood rosin. Exports for the past month may be found by subtracting figures given on page 252 of CHEMICAL INDUSTRIES, (March number) from the figures above; above figures include gum and wood rosin.

**Shellac Prices, Weekly High-Low**

| | London | | | | Calcutta | N. Y. City | | | | | | Shellac Varnish, N. Y. City | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | U. S. in c. Close of week | | T.N.C.&F. | Bone Dry 10 | 5-9 | 1-4 | | | | Orange 5 lb. | 4½lb. | 4 lb. | White 5 lb. | 4½lb. | 4 lb. |
| Week Ending | March High-Low | May High-Low | Mar. | May | N. Y.† | bbls. | bbls. | bbls. | T. N. | Superfine | Garnet | cut | cut | cut | cut | cut | cut |
| Close Feb. 8 | 89s 6d | 91s 6d | | | 17⅛c | 29c | 30c | 31c | 21–23¾c | 23–23¾c | 24–25c | $1.20 | $1.15 | $1.10 | $1.45 | $1.40 | $1.35 |
| Mar. 2 | 92s 6d-89s 6d | 92s-90s | 19.8c | 19.5c | 17⅛ | 29 | 30 | 31 | 21–23¾ | 23–23¾ | 24–25 | 1.20 | 1.15 | 1.10 | 1.45 | 1.40 | 1.35 |
| Mar. 9 | 92s-86s | 94s-87s 6d | 19.9 | 20.3 | 17¼ | 29 | 30 | 31 | 21–23¾ | 23–23¾ | 24–25 | 1.20 | 1.15 | 1.10 | 1.45 | 1.40 | 1.35 |
| Mar. 16 | 94s-88s 6d | 91s-89s 6d‡ | 19.7 | 19.5‡ | 16¾ | 29 | 30 | 31 | 21–23¾ | 23–23¾ | 24–25 | 1.20 | 1.15 | 1.10 | 1.45 | 1.40 | 1.35 |
| Mar. 23 | 90s-87s 6d‡ | 91s-88s | 19.4‡ | 19.5 | 16⅝ | 29 | 30 | 31 | 21–23¾ | 23–23¾ | 24–25 | 1.20 | 1.15 | 1.10 | 1.45 | 1.40 | 1.35 |
| Mar. 29 | 89s 6d*-87s 6d‡ | 90s-87s 6d* | 18.9*‡ | 18.9* | 16½† | 29 | 30 | 31 | 21–23¾ | 23–23¾ | 24–25 | 1.20 | 1.15 | 1.10 | 1.45 | 1.40 | 1.35 |
| Close Mar. 29* | 87s 6d | 87s 6d | 18.9 | 18.9 | 16½ | 29 | 30 | 31 | 21–23¾ | 23–23¾ | 24–25 | 1.20 | 1.15 | 1.10 | 1.45 | 1.40 | 1.35 |

†per cwt.; ‡Aug.; *March 29 last trading day.

unchanged on the basis of '33-'34 production.*

## Can Increase Figure

Because the entire '33-'34 naval stores production (450,000 bbls. of turpentine and 1,500,000 bbls. of rosin) has passed into consumers hands strong sentiment prevailed in favor of employing similar figures for '34-'35 production. However the Control Committee is limited in its authority and after it has determined minimum production it cannot again make further reduction but can increase the figure should conditions so warrant. It is quite likely that the Committee concluded that prudence dictated the lower figure in case the present recovery should for any reason falter, with the understanding that production would be increased if conditions so warranted. A very distinct feeling prevailed at the meeting that under no consideration did the Committee wish to appear to be lowering production beyond reasonable totals for the sole purpose of raising prices unduly.

Thoughtful and well-informed naval stores leaders are recognizing the pertinent fact that the export trade is vital to the industry and while higher prices in the domestic market are welcome that too high levels at this time will encourage purchase of naval stores in international trade from countries other than the U. S. and will encourage a number of countries to enlarge present naval stores activities or to possibly enter into production.

## Little Change in Price

Rosin prices advanced and then declined in the past month with the result that the net changes were small. They were, however, largely on the downward side, losses ranging from 5 to 10c. Turpentine declined 2½c between Feb. 28 and Mar. 31.

The statistical position of the industry as it enters the new year is decidedly encouraging. Stocks of both turpentine and rosin at American ports are now at the lowest point in 6 years and there is little reason to believe that consumers' stocks are unusually heavy. In order to "beat the gun" on allotments producers rushed rosin to ports in March, receipts being 40 to 50% above March of last year. Despite such action stocks are low. For example stocks of rosin at Jacksonville declined 55,217 bbls. in the past year, from 116,429 bbls., to 61,212. Turpentine declined 15,665 bbls., from 36,712 to 21,047 bbls. Total stocks at Savannah, Jacksonville and Pensacola are now about 142,000 bbls. of rosin and 46,665 bbls. of turpentine.

Effective Mar. 30 FF wood rosin was quoted at $5.10. Prices fluctuated throughout the month. Wood rosin producers have taken the position that theirs is a

### Statistics of the Jacksonville, Savannah, Pensacola Markets

| Grade | Close Feb. 28 | March 3 | March 10 | March 17 | March 24 | March 31 | Same Time Last Year | Net Gain or Loss for Month | Net Gain or Loss from Last Year |
|---|---|---|---|---|---|---|---|---|---|
| B | $4.25 | $4.25 | $4.35 | $4.05 | $4.25 | $4.25–4.35 | $1.70–1.90 | ...... | $+2.55 |
| D | 4.50 | 4.50 | 4.60 | 4.35 | 4.50 | 4.40–4.60 | 1.95 | —0.10 | +2.45 |
| E | 5.00 | 5.00 | 5.00 | 4.55 | 4.75 | 4.85–4.90 | 2.45 | —0.15 | +2.40 |
| F | 5.15 | 5.15 | 5.20 | 4.85 | 5.10 | 5.10–5.15 | 2.70 | —0.05 | +2.40 |
| G | 5.15 | 5.15 | 5.20 | 4.85 | 5.10 | 5.15 | 2.70 | ...... | +2.45 |
| H | 5.20 | 5.15 | 5.20 | 4.85 | 5.10 | 5.15 | 2.70 | —0.05 | +2.45 |
| I | 5.25 | 5.15 | 5.25 | 4.90 | 5.10 | 5.15 | 2.75 | —0.10 | +2.40 |
| K | 5.25 | 5.15 | 5.25 | 4.90 | 5.10–5.15 | 5.15 | 3.05 | —0.10 | +2.10 |
| M | 5.25 | 5.15 | 5.25 | 4.90 | 5.15 | 5.15 | 3.05 | —0.10 | +2.10 |
| N | 5.25 | 5.20 | 5.25 | 5.00 | 5.15 | 5.20–5.20 | 3.45 | —0.05 | +1.75 |
| W.G. | 5.30 | 5.20 | 5.25 | 5.00 | 5.15 | 5.20 | 3.50 | —0.10 | +1.70 |
| W.W. | 5.30 | 5.25 | 5.50 | 5.20 | 5.35 | 5.35 | 3.60 | +0.05 | +1.75 |
| X | 5.30 | 5.25 | 5.50 | 5.00 | 5.35 | 5.35 | 3.60 | +0.05 | +1.75 |
| Market | Firm | Firm | Firm | Firm | Firm | Firm | Firm | | |
| (Turpentine) | | | | | | | | | |
| Price | 58½c | 54½c | 57¼c* | 53c | 54¼c | 56–56½c | 37¾c | —2½c | +18¼c |
| Market | Firm | Firm | Firm | Firm | Firm | Firm | Firm | | |

| Week Ending | Spirits Receipts | Spirits Shipments | Rosin Receipts | Rosin Shipments | Same as Last Year Spirits Receipts | Same as Last Year Spirits Shipments | Same as Last Year Rosin Receipts | Same as Last Year Rosin Shipments |
|---|---|---|---|---|---|---|---|---|
| March 1-3 | 217 | 72 | 3,723 | 1,071 | 236 | .... | 1,709 | ....... |
| March 10 | 353 | 1,534 | 5,367 | 6,068 | 372 | 675 | 4,082 | 6,645 |
| March 17 | 786 | 2,462 | 5,223 | 6,979 | 707 | 781 | 3,984 | 4,943 |
| March 24 | 813 | 396 | 5,627 | 4,231 | 990 | 674 | 4,593 | 4,210 |
| March 31 | 1,260 | 1,230 | 6,375 | 5,994 | 1,005 | 1,179 | 5,194 | 3,764 |
| Total for month | 3,229 | 5,176 | 26,315 | 24,160 | 3,395 | 4,563 | 20,202 | 29,260 |
| Since Apr. 1, '33 | 104,727 | 120,392 | 432,316 | 487,533 | 95,019 | 99,554 | 381,446 | 419,454 |
| Foreign | ...... | 98,569 | ...... | 329,933 | ...... | 75,461 | ...... | 306,134 |
| Domestic | ...... | 21,823 | ...... | 157,600 | ...... | 24,093 | ...... | 113,320 |

| Stocks | Spirits | Rosin | Same as Last Year | |
|---|---|---|---|---|
| April 1 | 36,712 | 116,429 | 41,691 | 155,883 |
| March 1 | 23,334 | 59,057 | 38,338 | 125,628 |
| March 31 | 21,047 | 61,212 | 36,712 | 116,429 |
| Loss or gain in stocks in past month | —2,287 | +2,155 | ...... | ...... |
| Loss or gain in stocks since April 1, '33 | —15,665 | —55,217 | ...... | ...... |

| Grade (Savannah) | Close Feb. 28 | March 3 | March 10 | March 17 | March 24 | March 31 | Net Gain or Loss for Month |
|---|---|---|---|---|---|---|---|
| B | $4.25 | $4.25 | $4.40 | $4.05 | $4.25 | $4.35 | $+0.10 |
| D | 4.50 | 4.40 | 4.60 | 4.35 | 4.50 | 4.60 | +0.10 |
| E | 5.00 | 4.90 | 4.95 | 4.55 | 4.90 | 4.90 | —0.10 |
| F | 5.15 | 5.05 | 5.20 | 4.85 | 5.00 | 5.15 | ...... |
| G | 5.15 | 5.05 | 5.20 | 4.85 | 5.00 | 5.15 | ...... |
| H | 5.20 | 5.05 | 5.20 | 4.85 | 5.00 | 5.15 | —0.05 |
| I | 5.25 | 5.10 | 5.20 | 4.90 | 5.00 | 5.15 | —0.10 |
| K | 5.25 | 5.10 | 5.20 | 4.90 | 5.00 | 5.15 | —0.10 |
| M | 5.25 | 5.10 | 5.20 | 4.90 | 5.00 | 5.15 | —0.10 |
| N | 5.25 | 5.15 | 5.20 | 5.00 | 5.05 | 5.20 | —0.05 |
| W.G. | 5.30 | 5.15 | 5.20 | 5.00 | 5.05 | 5.20 | —0.10 |
| W.W. | 5.30 | 5.30 | 5.35–40 | 5.20 | 5.25 | 5.25 | —0.05 |
| X | 5.30 | 5.30 | 5.40 | 5.40 | 5.25 | 5.25 | —0.05 |
| Market | Firm | Firm | Firm | Firm | Firm | Firm | |
| Price of Turpentine | 58½c | 56½c | 57¼c | 53¼c | 54¼c | 56c | —2½c |
| Market | Firm | Firm | Firm | Firm | Firm | Firm | |

Highest turpentine price posted on Savannah Board of Trade April 1, 1920 at $2.33 a gal., lowest, Sept. 4, 1896 at 22c a gal. Lowest 1933 Savannah price 27c a gal.

| Week Ending | Spirits Receipts | Spirits Sales | Rosin Receipts | Rosin Sales | Same as Last Year Spirits Receipts | Same as Last Year Spirits Sales | Same as Last Year Rosin Receipts | Same as Last Year Rosin Sales |
|---|---|---|---|---|---|---|---|---|
| March 1-3 | 116 | 51 | 2,225 | 1,100 | 288 | | 1,530 | |
| March 10 | 220 | 93 | 4,434 | 2,622 | 376 | | 2,555 | |
| March 17 | 468 | 259 | 3,805 | 3,192 | 386 | | 2,026 | |
| March 24 | 578 | 221 | 1,929 | 6,232 | 676 | | 3,284 | |
| March 25-31 | 1,336 | 193 | 6,808 | 1,982 | 972 | | 3,878 | |
| Total for month | 2,718 | 817 | 19,301 | 15,128 | 2,692 | | 13,273 | |

| Stocks | Spirits | Rosin |
|---|---|---|
| Feb. 28 | 7,195 | 84,638 |
| March 31 | 5,295 | 74,691 |
| Loss or gain in stocks in past month | —1,900 | —9,947 |

| Week Ending (Pensacola) | Turpentine Receipts | Turpentine Shipments | Turpentine Stocks | Rosin Receipts | Rosin Shipments | Rosin Stocks |
|---|---|---|---|---|---|---|
| March 1-3 | 36 | 324 | 23,221 | 103 | 450 | 8,564 |
| March 10 | 29 | 347 | 21,903 | 714 | 1,590 | 7,688 |
| March 17 | 55 | 1,013 | 20,945 | 407 | 1,150 | 6,945 |
| March 24 | 79 | 701 | 20,323 | 299 | 400 | 6,969 |
| March 31 | | | | | | |

### London Naval Stores Market

| Week Ending | Rosin Weekly High—Low W. W. Grade | Turpentine Weekly High—Low | American Turpentine Stocks 1934 | American Turpentine Stocks 1933 |
|---|---|---|---|---|
| Close Feb. 28 | 17s 6d | 51s 3d | | |
| Mar. 2 | 17s 6d—17s | 52s 6d—49s 9d | | |
| Mar. 2 | 17s 6d—17s | 52s 6d—49s 9d | 15,977 | 14,531 |
| Mar. 9 | 17s—16s 9d | 50s 3d—49s | 16,839 | 13,722 |
| Mar. 16 | 16s 9d | 51s—50s 3d | 14,926 | 12,491 |
| Mar. 23 | 16s 9d | 51s 9d—48s 9d | 13,696 | 11,091 |
| Mar. 29 | 16s 9d | 51s 9d—51s | 12,819 | 10,439 |
| Close Mar. 29* | 16s 9d | 51s | | |

*Last trading day of the month.

**February production of naval stores by steam distillation and solvent treatment of wood and stocks of these products on hand Feb. 28, according to data collected by the producers' committee, through Arthur Langmeier, (Hercules Powder), secretary, were as follows:**

**PRODUCTION**

| | Rosin 500-lb. barrels | Turpentine bbls. (50 gallons) | Pine oil Gallons |
|---|---|---|---|
| Month of Feb. | 46,016 | 7,892 | 306,375 |
| Total from April 1, 1933 | 443,135 | 71,481 | 2,836,804 |
| **STOCKS AT PLANTS** | | | |
| Total February 28, 1934 | 86,492 | 17,859 | ...... |
| March 31, 1933 | 98,615 | 12,387 | ...... |
| Change | —12,123 | +5,472 | ...... |

**Note.—Rosin production and stocks include all grades of wood rosin.**

*Unit consists of 3⅓ bbls. of rosin and one bbl. of turpentine. Therefore production of 1,268,730 bbls. of rosin may be expected in the new naval stores year.

manufacturing industry, and that its products are not agricultural or farm products. A number of gum naval stores producers are insisting that wood rosin producers should be brought under the AAA under license. Final decision rests with Secretary Wallace and a hearing was announced for Apr. 6 in Washington.*

Volume of purchasing in March in primary centers was below earlier expectations. Buyers appeared willing to wait pending further developments on the allotment plan. In most quarters it is believed that consumers did not expect a cut in production and were somewhat taken unawares by the final action of the Control Committee.

*AAA will also license wood producers.

# *Oils and Fats*

## Eyes on Washington

Oil buyers focused attention on Washington during the past month. With much uncertainty surrounding the ultimate outcome of the proposed taxes on a number of important oils, purchasing has dwindled down to small replacement lots. Very little coconut oil changed hands. Consumers preferred to wait further developments on whether the new tax would be 5c, or 3c, or none at all. House, of course, appeared favorable to a 5c tax while in the Senate the possibility of a 3c tax not alone on coconut, but on imports of sunflower, palm kernel and palm oils seemed possible. In most quarters, however, it is expected that opposition from the administration and from consuming groups will in the end defeat proponents of these taxes or at least force modifications.

Out on the Coast sale of sardine at 20c was reported, but later reports seemed to indicate that the market was drifting lower, possibly to a 16 or 17c level. At Baltimore little activity has yet been noted in menhaden.

## Bankhead Bill

Prices in cottonseed oil futures were irregular throughout most of the past 30 day period. Advances were registered in the 1st 2 weeks of the month, largely a result of the passage of the Bankhead Bill by the House. As passed by the Lower House marketable production is limited to 10,000,000 bales and puts a 50% tax (in no case less than 5c) on all cotton marketed in excess of specified quotas which are allocated to various states. Measure is effective for 2 and possibly 3 years. It is expected that the measure will be strengthened further in the Senate. Memphis cottonseed meal market sagged slightly and closed out the month with declines from the February close. Markets for linters were quiet and steady.

## To Tax, Or Not To Tax—

Washington gossip is insistent that proposed 5c tax on coconut and sesame oils will be dropped for fear that its adoption might upset pending negotiations for Philippine independence.

Soap makers used 353,527,000 lbs. of coconut oil in '32. A 5c tax would increase cost 200%, and will raise price of soap 100%, according to most conservative estimates. Soap producers are pointing to increased home production of soap, a result of the depression, and, in addition,

**Bleachable Prime Summer Yellow (cents per lb. tanks)**

**(N. Y. Produce Exchange)**

| *Futures* | *Close –Feb. 28*–* | *–March 2*–* | *–March 9*–* | *–March 16*–* | *–March 23–* | *–March 29*†–* |
|---|---|---|---|---|---|---|
| March | 5.05—5.08 | 5.17—5.30 | 5.20—5.35 | 5.10 | 5.00 | 5.15 |
| April | 5.04—5.14 | 5.20—5.30 | 5.20—5.40 | 5.20—5.21 | 5.09—5.20 | 5.30—5.38 |
| May | 5.24—5.29 | 5.38—5.40 | 5.39—5.42 | 5.30 | 5.25—5.29 | 5.35—5.55 |
| June | 5.25—5.45 | 5.40—5.60 | 5.45—5.65 | 5.35—5.55 | 5.30—5.50 | 5.58—5.60 |
| July | 5.49—5.51 | 5.62—5.64 | 5.64 | 5.54—5.55 | 5.51—5.54 | 5.60—5.80 |
| August | 5.50—5.61 | 5.63—5.80 | 5.65—5.85 | 5.55—5.70 | 5.52—5.62 | 5.78—5.80 |
| September | 5.70s | 5.82—5.83 | 5.84—5.85 | 5.73—5.74 | 5.71—5.74 | 5.84—5.89 |
| October | 5.72—5.80 | ........ | 5.90 | 5.75—5.79 | 5.80—5.82 | 5.85—5.95 |
| November | | | | | | 5.85—5.89 |
| Total sales contracts for work | | 246 (40 Switches) | 373 (216 Switches) | 192 (40 Switches) | 313 (70 Switches) | 80 (No Switches) |
| Spot prime summer yellow | Nominal | Nominal | Nominal | Nominal | Nominal | Nominal |
| Crude, Southeast | 4.25—4.50 | 4.25 | 4.50 | 4.50 | 4.50 | 4.50 |
| Valley | 4.25—4.50 | 4.25 | 4.37½—4.50 | 4.37½ | 4.37½ | 4.50 |
| Texas | 4.00 | 4.00 | 4.25 | 4.25 | 4.25 | 4.12½ |

*Closing price on Fridays; sSale; †Last trading day of the month.

**Memphis Cottonseed Meal Market**

| *Futures* | *–Close Feb. 28*–* | *–March 2*–* | *–March 9*–* | *–March 16*–* | *–March 23–* | *–March 29*†–* |
|---|---|---|---|---|---|---|
| March | $24.10—24.50 | $23.35—23.65 | $23.80 | $23.90—24.25 | $23.90 | |
| April | 24.45—24.75 | 23.90—24.25 | 24.00—24.30 | 23.95—24.50 | 23.80—24.05 | $23.60—24.00 |
| May | 24.85—25.20 | 24.40—24.85 | 24.30—24.75 | 24.50 | 24.15—24.35 | 24.25—24.50 |
| June | 25.35—25.60 | 24.85—25.25 | 24.90—25.25 | 24.85—25.15 | 24.50—24.75 | 24.25—24.75 |
| July | 25.75—26.25 | 25.50 | 25.35—25.55 | 25.25—25.60 | 25.15 | 24.90—25.25 |
| August | 26.00—26.25 | 25.65—26.00 | 25.75—26.10 | 25.60—26.00 | 25.40—27.75 | 25.30—25.65 |
| Sept. | 26.10—26.50 | 26.00—26.50 | 26.00—26.50 | 25.85—26.25 | 25.80—26.00 | 25.75 |
| October | | 26.00—26.75 | 26.00—26.75 | 26.00—26.50 | 25.85—26.25 | 26.00—26.50 |
| Nov. | | | | | | 26.25—26.75 |

*Friday prices; †last trading day of month.

**Cottonseed Products**

| | *On hand August 1* | *Produced Aug. 1 to Feb. 28* | *Shipped out Aug. 1 to Feb. 28* | *On hand February 28* |
|---|---|---|---|---|
| Crude oil, pounds— | | | | |
| 1933-1934 | *51,269,417 | 1,031,984,313 | 930,916,479 | *173,761,396 |
| 1932-1933 | 29,523,581 | 1,068,889,671 | 969,866,704 | 159,497,063 |
| Refined oil, pounds— | | | | |
| 1933-1934 | †676,331,574 | ‡810,468,897 | ....... | †811,464,492 |
| 1932-1933 | 628,420,148 | 831,094,054 | ....... | 802,479,881 |
| Cake and meal, tons— | | | | |
| 1933-1934 | 160,874 | 1,506,848 | 1,388,619 | 279,103 |
| 1932-1933 | 114,656 | 1,557,566 | 1,340,650 | 331,572 |
| Hulls, tons— | | | | |
| 1933-1934 | 76,686 | 889,634 | 876,298 | 90,022 |
| 1932-1933 | 162,773 | 979,072 | 996,233 | 145,612 |
| Linters, running bales— | | | | |
| 1932-1933 | 70,786 | 617,488 | 546,108 | 142,166 |
| 1932-1933 | 235,521 | 544,748 | 492,441 | 287,828 |
| Hull fiber, 500-lb. bales— | | | | |
| 1933-1934 | 985 | 34,386 | 31,952 | 3,419 |
| 1932-1933 | 4,138 | 13,618 | 6,571 | 11,185 |
| Grabbots, motes, etc., 500-lb. bales— | | | | |
| 1933-1934 | 3,216 | 29,080 | 23,611 | 8,685 |
| 1932-1933 | 15,250 | 19,109 | 16,810 | 17,549 |

*Includes 4,274,646 and 17,981,021 pounds held by refining and manufacturing establishments and 14,320,860 and 22,038,630 pounds in transit to refiners and consumers August 1, 1933, and February 28, 1934, respectively.

†Includes 5,498,953 and 2,996,513 pounds held by refiners, brokers, agents, and warehousemen at places other than refineries and manufacturing establishments, and 12,642,917 and 2,293,912 pounds in transit to manufacturers of lard substitute, oleomargarine, soap, etc., August 1, 1933, and February 28, 1934, respectively.

‡Produced from 879,647,643 pounds of crude oil.

**Exports for Six Months Ended January 31**

| | | *1934* | *1933* |
|---|---|---|---|
| Oil, crude | pounds | 10,654,295 | 21,429,787 |
| Oil, refined | pounds | 3,467,419 | 4,052,050 |
| Cake and meal | tons of 2,000 pounds | 66,585 | 110,423 |
| Linters | running bales | 84,574 | 84,237 |

**Cottonseed Products Prices**

| | *Atlanta* | | | | | | *Hull (England)* | | *Chicago* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Week Ending* | *Prime Crude oil* | *7% Meal** | *Hulls Loose* | *1st cut* | *Linters Clean Mill* | *2nd cut* | *Refined Weekly, High-Low* | *Egyptian crude Weekly, High-Low* | *Prime oil* | *Yellow oil Del. Chgo.* | *Edible Carlots* |
| Close Feb. 28 | 4¼c | $25 | $14 | 4½c | 4c | 3¾c | 15s 6d | 13s 6d | 4¼c | 5½c | 6¼c |
| March 7 | 4¼ | 25 | 14 | 4½—5 | 4 | 3¾—4 | 15s 6d—15s | 13s 6d—12s 9d | 4¼—4⅜ | 5½ | 6½—6¾ |
| March 16 | 4½ | 25 | 14 | 4½—5 | 4 | 3¾—4 | 15s—14s 6d | 12s 9d—12s 3d | 4⅛—4½ | 6 | 6¾—7 |
| March 23 | 4½ | 25 | 14 | 4½—5 | 4—4½ | 3¾—4 | 14s 6d | 12s 3d—12s | 4 —4⅜ | 6 | 6¾—7 |
| March 29 | 4.38 | 25 | 14 | 4½—5 | 4 | 3¾—4 | 14s 6d | 12s | 4⅛—4⅝ | 6 | 6¾—7 |

*Interior mill points; †per cwt.

fear large soap importations against which there is but a 15% tariff rate.

Soap production consumes 64.4% of the total coconut oil consumption; oleomargarine, 22.4%*. March *Tide* (magazine for adman) sees the soap industry the innocent victim of the farmer's spleen against oleo. "When the chance came to take a crack at poor oleo via revenue tax, farm and dairy men were on the job. And thus it happened that the little stepchild industry got the big powerful soap industry in a spot."

Cottonseed oil can and is used in oleomargine production but, according to certain reports, oleo producers still have huge stocks of coconut oil bought at bargain levels. Should the tax be imposed, however, it is possible that by denaturing soap producers might mind a loop-hole.

Livestock producers are also interested. They see higher beef cattle prices through taxing coconut oil because tallow would be used in the place of coconut oil in soap. Soap producers counter with the statement that the value of a 1,000 lb. steer could increase but 2½c; they also insist that tallow containing no lauric acid has no free lathering qualities and cannot supplant coconut oil in soap making. They support statement that the use of coconut increases uses of domestic fats and oils in soap with figures indicating that while U. S. population increased 31% between '12 and '32 domestic oils and fats consumption increased 50%.

Cotton farmers see possibilities too. Soap makers have several answers, however, contending that cottonseed oil makes an inferior soap with no lathering properties and, in addition, contains linolic acid which causes soap to become rancid. Cotton production would have to be increased 30% (3,900,000 bales). Such increase would throw the Government's cotton acreage reduction completely askew. Soap makers see the industry ruined and domestic markets supplied by Canadian factories. Copra producers of British Island possessions and foreign soap manufacturers rather than the American farmer will be the ultimate beneficiaries of a coconut oil tax, say the harassed soap producers.*

Senate draft of the tax bill has added palm oil, palm kernel oil, sunflower oil and fish and whale oils to the House draft which included only coconut and sesame oils and copra, but has reduced tax to 3c. British look upon such inclusion in the light of higher tariff rates rather than a "processing tax."

*Coconut oil is the only oil that can be used in tanning of white leather. It is necessary also in other vital chemical or process industries.

## Price Comparison, Principal Vegetable, Animal and Fish Oils

| Oil | San Francisco Feb. 26 | San Francisco Mar. 26 | Chicago Mar. 2 | Chicago Mar. 30 | Baltimore Feb. 28 | Baltimore Mar. 30 | N. Y. Mar. 2 | N. Y. Mar. 30 |
|---|---|---|---|---|---|---|---|---|
| Vegetable Oils: | | | | | | | | |
| Coconut, crude, tanks... | 2⅝c* | 2⅝c* | 2⅜c* | 2⅜c* | | | 2⅜c* | 2⅜c* |
| Chinawood, tanks...... | 7.4* | 7⅜* | 8.2 del. | 8.2 del. | | | 8.2 del. | 7.6 del. |
| Corn, crude, tanks...... | | | 4¾ del. | 4⅝ del. | | | 4⅞a | 4⅝a |
| Peanut, crude, tanks.... | 5‡ | 5‡ | 4¾b | 4¾† | | | 4¾b | 5b |
| Perilla, tanks.......... | 8¾* | 8¼* | | | | | 8¾* | nominal |
| Soybean, dom, tanks.... | 6¾ del. | 7 del. | 5.8a | 5.9a | | | 6½a | 6½a |
| Soybean, crude, Oriental | 3⅝† | 3⅝† | | | | | | |
| Sesame, crude, tanks.... | 5⅜‡ | 5⅜‡ | | | | | | |
| Fish Oils: | | | | | | | | |
| Menhaden, crude, tanks. | | | | | no prices | .16b | | |
| Menhaden, light pressed, tanks.............. | | | 5½—5¾ | 6—6¼ | | | 4 7/10 | 4 9/10 |
| Salmon, tanks......... | 15‡ | no prices | 15—17‡ | 16—17‡ | | | 15‡ | no prices |
| Whale, tanks.......... | | | | | | | | |
| Herring, tanks......... | 5‡ | no prices | 15‡ | no prices | | | 15‡ | no prices |
| Sardine, tanks......... | 15‡ | 20‡ | 15—16‡ | 16—17‡ | | | 15‡ | no prices |
| Animal Oils: | | | | | | | | |
| Degras, com. dom...... | | | 4—5 | 4—5 | | | | |
| com. neut...... | | | 10—10¼ | 10½—11 | | | | |
| Lard No. 1........... | | | 6¾—7¼ | 6¾—7 | | | | |
| No. 2........... | | | 6¼—6¾ | 6¼—6¾ | | | | |
| Extra........... | | | 7½—7¾ | 7½—7¾ | | | | |
| Oleo, No. 1........... | | | 5½—6 | 5½—6 | | | | |
| No. 2........... | | | 4¾—5¼ | 4¾—5¼ | | | | |
| Tallow, acidless........ | | | 6½—6¾ | 6¾—7 | | | | |

*f.o.b. tank cars, Pacific Coast Ports; c.i.f. Pacific Coast Ports, bulk, steamers tanks; ‡f.o.b. tank cars, Pacific Mills; *a*f.o.b. Mid-west mills; *b*f.o.b. producing point; *n*-nominal.

### Soapers' Views

Magazine *Soap* has questioned soap producers, oil and fat traders, etc., to determine opinions with the following results: soap makers have been going on the premise that the tax will become law. Some plants have been running extra shifts saponifying coconut oil and putting the soap in storage. This has been done in the hope that the tax will not reach down to finished stocks. Article asks but does not answer a very pertinent question. The question is: "If merely a small percentage of caustic soda or potash are added to each tank of coconut oil, can it be classified as soap, or partially manufactured soap, or is it still oil until finished?" *Soap* summarizes concensus of opinions: "There is the likelihood of a tax of something up to 2c on all imported oils and fats. This tax will boost the tallow market 1c to 1½c. Soap prices should advance 20 to 30%, according to type. Tallow market will probably establish itself at prices ¼c to ⅜c under coconut oil figures. Present proportion of coconut, palm, olive and other imported oils in soap will not be changed materially.†

## *Fertilizers*

Russian potash caused a mild "commotion" in the potash markets in the past month. It is reported that practically all of the original offering of 12,000 tons has been taken up and removed from the market. Summer prices for potash have not been announced.

Purchasing of raw materials was generally of a routine nature. Because of the lateness of the season this year last minute replacement buying has not as yet been felt to any great degree. Price fluctuations

†Soap sales reported close to '29 levels.

## Fertilizer Materials, Principal Selling Points

| Product | N. Y. Feb. 28 | N. Y. Mar. 31 | Chicago Feb. 28 | Chicago Mar. 29 | Baltimore Feb. 28 | Baltimore Mar. 31 | Atlanta Feb. 28 | Atlanta Mar. 29 | San Francisco Feb. 27 | San Francisco Mar. 26 |
|---|---|---|---|---|---|---|---|---|---|---|
| Ammonium sulfate, bulk, dom.................. | $25.00p | $25.00 | | | $25.00p | $25.00 | $25.00p | $25.00 | $29.00p | $30.00 |
| Ammonium sulfate, imp... | 25.00p | 25.00 | | | 25.00p | 25.00 | 25.00p | 25.00 | 29.00p | 30.00 |
| Blood, dried, dom........ | 3.25 | 3.25 | $ 2.75 | $ 2.90 | 3.00 | 3.25 | | | 2.50 | 2.40 |
| Blood, dried, imported.... | 3.10 | 3.15 | | | | | 3.25 | 3.25 | 3.00† | 2.55 |
| Bone, Raw, 4½ & 50..... | | | 22.00 | 22.00 | 26.00 | 26.00 | | | 24.00 | 24.00 |
| Bone steamed, 1¼ & 60... | | | 16.00 | 16.00 | | | | | 23.00 | |
| Bone 3 & 50 meal........ | | | 18.00 | 18.00 | 25.00 | 25.00 | | | | 23.00 |
| Bone, South America, to arrive................ | 25.50p | 25.50 | | | | | | | | |
| Castor Pumice, dom...... | 17.50p | 18.50 | 17.50pp | 18.50 | 17.50pp | 18.50 | 17.50pp | 18.50 | | |
| Castor Pumice, imp....... | 18.50p | 19.50 | | | 18.50p | 19.50 | 18.50p | 19.50 | | |
| Cyanamid.............. | 1.07½d | 1.07½ | 1.67½d | 1.07½d | 1.07½d | 1.07½ | 1.07½d | 1.07½ | | |
| Fish scrap, unground..... | | | | | 3.15 & 10 | 3.25 & 10 | | | | |
| Fish meal.............. | | | | | 42.43 | No offerings | 3.25 & 10 | 3.25 & 10 | 33-30-29a | 38.50-31-32.50 |
| Garbage, tankage........ | | | | | None | 2.75, 10 & 70 | | | | |
| Hoof meal, dom.......... | | | 2.60 | 2.50 | | | | | | |
| Nitrogenous material..... | 3.15pp | 3.10 | 2.25 | 2.55 | 2.90pp | 2.80 | | 2.55pp | | |
| Nitrogenous material, imp | 2.90p | 2.25 | | | 2.75† | 2.25 | | 3.10p | | |
| Sodium nitrate.......... | 24.50p | | | | 24.50p | 24.50 | 24.50p | 24.50 | 26.00 | 26.00 |
| Superphosphate, 16%.... | | | | | 8.00 | 8.00 | 12.10—10.90** | 12.10—10.90 | 0.85unitb | 0.85 unitb |
| Tankage............... | Nominal | Nominal | 2.35 & 10 | 2.35 & 10 | | | 2.70 & 10‡ | 2.65 & 10 | 2.80 & 10 | 3.10 & 10 |
| Tankage, imp........... | 2.75 & 10d | 3.25 & 10 | | | | 3.25 & 10 | 3.25 & 10p | 3.25 & 10 | 2.90 & 10† | 2.95 & 10 |

*p*Ports; *pp*Production points; *d*Delivered; *c.a.f.Baltimore; †c.i.f.Ports; ‡f.o.b. Chicago; **Higher price interin points, lower price coast quotation; *a*1st price f.o.b. Monterey; 2nd price San Francisco; 3rd price c.i.f. Pacific Coast ports.(Japanese materials) *b*Jap material 75c per unit c.i.f. Pacific Coast ports, prompt shipment.

were generally centered in the organic ammoniates, with imported materials specially weak as the month closed. Little is heard at the moment in the market about higher sulfate and nitrate prices and the whole situation is uncertain. Sale of mixed fertilizer continues to show remarkable advances over anything seen in several years and producers are extremely optimistic. The Bankhead Bill has cast a doubt into the picture as to what ultimate effect it will have (if passed and there is little doubt but that it will) on not only this season but for the next 3 years. February fertilizer imports were up 35% and exports up 84% over the same period in '33.

L. M. Bogle will represent American Potash & Chemical in Atlanta. W. Whitely Baker is the new manager of the Baltimore office of H. J. Baker & Bro.

## *Coal Tar Chemicals*

Demand for toluol was the outstanding feature of March coal tar markets. On the other hand benzol requirements, specially in the tire industry were off slightly from the heights reached in the previous month. Lacquer manufacturers were busy and appeared to be somewhat behind production schedules or customer demands. Purchasing by chemical processors or dye manufacturers was of a steady but quiet nature. Eastern jobbers of ball or flake naphthalene were given during the month a 5% discount off the f. o. b. price.

**Important Price Changes**

| | Feb. 28 | Mar. 31 |
|---|---|---|
| **ADVANCED** | | |
| None | | |
| **DECLINED** | | |
| Naphthalene, imp.... | $1.75 | $2.15 |

Particularly encouraging was the decided pick-up reported by phenol producers in the tonnages moving into the synthetic resin field. Prices remained firm throughout the 30-day period. Reduction in imported naphthalene was partially due to monetary fluctuation. Dyestuff intermediate manufacturers continued 1st quarter prices on aniline oil, benzidine base, dinitrobenzene, etc., into the 2nd quarter. Purchasing of creosote oil for railroad ties was said to be in more encouraging quantities than for something past. Some hesitancy was reported by textile dyers as the seasonal slump arrived, but generally speaking both prices and volume were satisfactory. Coking operations were such as to prevent any accumulations of material likely to influence price structure.

## *Solvents*

U. S. I.'s Glenn Haskell presided at a meeting March 14 of alcohol producers at which a code was drawn up. Code follows Chemical Alliance on wages and hours and has been forwarded to Washington for final approval. Mr. Haskell is Industrial Alcohol Institute president and a U. S. I. vice-president.

### Still Another Suit

Leonard E. Wales, Washington U. S. district attorney, has filed notice in U. S. District Court that the government will file suit against American Solvents & Chemical (of California) and 2 bonding companies involving claims by the government for more than $3,000,000. Mr. Wales says American Solvents will be charged

### February Fertilizer Tag Sales

| | Equivalent tons* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | February | | | | January-February | | | |
| | P.C. of 1933 | 1934 | 1933 | 1932 | P.C. of 1933 | 1934 | 1933 | 1932 |
| South— | | | | | | | | |
| Virginia† | 115 | 56,213 | 48,930 | 66,501 | 133 | 88,347 | 66,368 | 77,247 |
| North Carolina | 113 | 88,548 | 78,451 | 75,521 | 144 | 201,811 | 139,816 | 124,541 |
| South Carolina | 172 | 84,490 | 49,068 | 59,829 | 207 | 165,901 | 80,238 | 77,379 |
| Georgia | 284 | 94,500 | 33,321 | 51,117 | 312 | 130,427 | 41,749 | 56,517 |
| Florida† | 110 | 39,560 | 35,928 | 40,650 | 96 | 82,498 | 85,905 | 100,475 |
| Alabama | 269 | 54,150 | 20,100 | 18,100 | 232 | 74,600 | 32,150 | 30,650 |
| Mississippi | 252 | 19,755 | 7,850 | 16,933 | 188 | 27,930 | 14,875 | 17,933 |
| Tennessee† | 216 | 14,760 | 6,842 | 8,785 | 171 | 16,125 | 9,452 | 9,372 |
| Arkansas‡ | 317 | 11,410 | 3,600 | 5,100 | 357 | 17,120 | 4,800 | 6,500 |
| Louisiana† | 316 | 16,747 | 5,300 | 7,104 | 234 | 26,558 | 11,350 | 12,384 |
| Texas† | 348 | 18,650 | 5,360 | 9,955 | 200 | 25,590 | 12,805 | 18,070 |
| Oklahoma | 273 | 2,870 | 1,050 | 2,160 | 207 | 3,620 | 1,750 | 2,410 |
| Total South | 170 | 501,653 | 295,800 | 361,755 | 172 | 860,527 | 501,258 | 533,478 |
| Midwest: | | | | | | | | |
| Indiana | 246 | 9,094 | 3,700 | 6,006 | 184 | 9,719 | 5,294 | 6,600 |
| Illinois | 236 | 4,046 | 1,716 | 1,172 | 237 | 4,199 | 1,771 | 2,245 |
| Kentucky | 126 | 9,267 | 7,327 | 6,976 | 98 | 11,892 | 12,112 | 10,697 |
| Missouri | 321 | 7,519 | 2,346 | 5,816 | 350 | 8,400 | 2,399 | 6,012 |
| Kansas | 138 | 145 | 105 | 1,080 | 164 | 180 | 110 | 1,080 |
| Total Midwest | 198 | 30,071 | 15,194 | 21,050 | 159 | 34,390 | 21,686 | 26,634 |
| Grand total | 171 | 531,724 | 310,994 | 382,805 | 171 | 894,917 | 522,944 | 560,112 |

*Monthly records of fertilizer tax tags are kept by State Control Officials and are slightly larger or smaller than the actual sales of fertilizer. The figures indicate the equivalent number of short tons of fertilizer represented by the tax tags purchased and required by law to be attached to each bag of fertilizer sold in the various States. †Cottonseed meal sold as fertilizer included. ‡Excludes 13,650 tons of cottonseed meal for January-February combined, but no separation is available for the amount of meal used as fertilizer from that used as feed.

### United States Imports and Exports of Fertilizer and Fertilizer Materials By Classes—Total for All Countries—Long Tons

*(Summarized by The Nat'l Fertilizer Ass'n from Dept. of Commerce Preliminary Reports)*

| | February | | | January-February | | |
|---|---|---|---|---|---|---|
| | 1934** | 1933 | 1932 | 1934 | 1933 | 1932 |
| **IMPORTS** | | | | | | |
| Ammonium sulfate | 30,003 | 42,624 | 19,232 | 72,513 | 81,268 | 38,419 |
| Ammonium-sulfate-nitrate | 0 | 0 | 0 | 0 | 0 | 75 |
| Calcium cyanamide | 10,956 | 5,294 | 6,252 | 18,778 | 14,755 | 11,442 |
| Calcium nitrate | 2,045 | 2,283 | 1,133 | 5,396 | 5,617 | 2,562 |
| Guano | 171 | 6,052 | 24 | 189 | 6,372 | 3,233 |
| Dried blood | 257 | 231 | 425 | 460 | 359 | 1,133 |
| Sodium nitrate | 17,343 | 2,516 | 8,404 | 51,033 | 2,921 | 41,538 |
| Urea and calurea | 322 | 536 | 579 | 898 | 917 | 1,525 |
| Ammonium phosphates | 862 | 90 | * | 1,095 | 201 | * |
| Tankage | 947 | 1,184 | 1,939 | 1,601 | 2,785 | 3,905 |
| Other nitrogenous | 7,833 | 4,647 | 2,144 | 14,285 | 5,597 | 2,361 |
| Total nitrogenous materials | 70,739 | 65,457 | 40,132 | 166,248 | 120,792 | 106,193 |
| Bone phosphates | 1,129 | 2,379 | 3,698 | 3,350 | 4,836 | 7,368 |
| Superphosphates | 1,180 | 2,160 | 568 | 2,480 | 3,559 | 2,415 |
| Phosphate rock | 0 | 0 | 0 | 0 | 2,100 | 0 |
| All other phosphates | 0 | 0 | 1,089 | 0 | 0 | 1,089 |
| Total phosphate materials | 2,309 | 4,539 | 5,355 | 5,830 | 10,495 | 10,872 |
| Muriate of potash | 11,825 | 4,911 | 6,313 | 21,564 | 11,662 | 10,603 |
| Kainite, 14% | 4,995 | 3,134 | 7,846 | 6,733 | 7,269 | 10,157 |
| Kainite, 20% | 2,461 | 0 | ‡ | 13,747 | 2,552 | ‡ |
| Manure salts, 30% | 21,237 | 6,463 | 19,484 | 29,728 | 15,596 | 23,142 |
| Sulfate of potash | 3,346 | 1,547 | 2,039 | 5,863 | 3,274 | 4,025 |
| Sulfate of pot. magnesia | 1,875 | 620 | * | 4,643 | 938 | * |
| Nitrate of potash | 1,549 | 1,141 | * | 2,245 | 1,490 | * |
| Other potash | 5 | 182 | 47 | 12 | 185 | 47 |
| Total potash materials | 47,293 | 17,998 | 35,729 | 84,535 | 42,966 | 47,974 |
| Nit-phos-& pot. fertilizers | 193 | 465 | 421 | 701 | 1,009 | 528 |
| Other fertilizers | 1,311 | 1,890 | 2,523 | 4,858 | 9,454 | 6,660 |
| Grand total | 121,845 | 90,349 | 84,160 | 262,172 | 184,716 | 172,227 |
| **EXPORTS** | | | | | | |
| Ammonium sulfate | 56 | 551 | 2,237 | 1,171 | 697 | 9,962 |
| Other nitrogenous chemicals† | 13,570 | 6,712 | 29,632 | 21,355 | 14,956 | 41,545 |
| Nitrogenous organic waste | 614 | 573 | 245 | 1,941 | 1,012 | 307 |
| Total nitrogenous materials | 14,240 | 7,836 | 32,114 | 24,467 | 16,665 | 51,814 |
| High grade hard rock | 13,925 | 1,554 | 9,793 | 18,325 | 4,518 | 20,828 |
| Land pebble rock | 75,496 | 47,419 | 55,131 | 117,458 | 87,726 | 99,368 |
| Total phosphate rock | 89,421 | 48,973 | 64,924 | 135,783 | 92,244 | 120,196 |
| Superphosphates | 816 | 1,116 | 141 | 1,597 | 1,868 | 2,940 |
| Other phosphate materials | 1,402 | 54 | 197 | 2,563 | 159 | 326 |
| Total phosphate materials | 91,639 | 50,143 | 65,262 | 139,943 | 94,271 | 123,462 |
| Potash fertilizers | 1,057 | 850 | 54 | 2,249 | 3,320 | 55 |
| Concentr'd. chem. fertilizers | 2,950 | 985 | 701 | 3,606 | 1,707 | 2,120 |
| Prepared fertilizer mixtures | 52 | 80 | 133 | 63 | 94 | 155 |
| Grand total | 109,938 | 59,894 | 98,264 | 170,328 | 116,057 | 177,606 |

*Not previously stated separately. ‡Included in kainite, 14%. †Chiefly domestic synthetic sodium nitrate. **The *import* figures represent the imports entered for consumption *plus* withdrawals from warehouses for consumption.

with illegal diversion of alcohol into beverage channels. He will ask that the firm be penalized $2,824,250 at a rate of $6.40 a gal. U. S. Guarantee Co., N. Y. City, is named co-defendant in a 2nd suit and government will claim, Mr. Wales says, forfeiture of a $50,000 bond. Royal Indemnity, is named co-defendant in a 3rd suit in which, according to Mr. Wales, government will claim forfeiture of a $200,000 bond. This is the 3rd recent suit of the government charging illegal diversion.

*Empire Distilling, newest alcohol producer, opens Philadelphia plant.*

### Price Stability

No price changes of importance were announced in the solvent group in the past month. Petroleum solvents were steady. Producers of ethyl acetate, butyl acetate, butyl phthalate, butyl alcohol, acetone and other solvents reported no price changes for the 2nd quarter. Stocks of denatured alcohol are not excessive, and producers report satisfaction with the tonnage moved out in the past season.*

### A Lower Tax?

A determined effort has been made before the Senate Finance Committee, by interested industries using tax-paid alcohol for non-beverage purposes to have the tax reduced from $2 to the former $1.10 level. Julian Boyd, Pacific Coast Borax, has been re-elected president, Mining Association of the Southwest.

### Syrup's Plant Bid In

Metropolitan Alcohol Corp. of N. Y. offered $475,000 for the Syrup Products alcohol plant at Yonkers, N. Y., in a public auction sale on Mar. 26. Bid was for $47,500 down payment and balance in 10 annual installments. This offer will be submitted to Federal Court.

## *Textile Chemicals*

Arthur Stull, Ph. D., Dept. of Allergy, Roosevelt Hospital, spoke on "Allergic Reactions to Materials Used in Textiles," before N. Y Section, A.A.T.C. & C. To the uninitiated subject has to do with skin conditions.

*Methanol denaturing grade was raised Apr. 6 from 40 to 43c.

### No Price Favoritism

Sig. Saxe, Philippine Cutch Corp.'s president, denies in paid advertisement (*Hide & Leather*, Mar. 3) rumor that certain tanners are being favored with special inside prices on cutch by the corporation. "Price to all since Jan. 1 and up to and including June 30 is 3½c f. o. b. cars at import dock, N. Y., basis 55% tannin," states Mr. Saxe.

**Important Price Changes**

| | Feb. 28 | Mar. 31 |
|---|---|---|
| **ADVANCED** | | |
| Valonia, beards | $40.00 | $39.00 |
| **DECLINED** | | |
| Mangrove bark | $27.00 | $30.00 |
| Myrobalans, J1 | 27.00 | 32.00 |
| Wattle Bark | 30.00 | 31.00 |

### And Spring Has Just Arrived

Significant advance trends in the Fall color picture have determined the selection of 6 high-fashion and 5 classic staple colors for women's shoes, it was announced today by Margaret Hayden Rorke, managing director of the Textile Color Card Association. These represent the official shades adopted by the joint committee of tanners, shoe manufacturers and retailers working in cooperation with the color organization.

### New Members

New A. A. T. C. & C. applicants are: William Beck, John Campbell chemist; Herbert Seyferth, National Aniline & Chemical chemist, Buffalo; Henry Weiss, Calco; Sidney L. Wheaton, dyeing technican, International Braid. Junior memberships: J. H. Ciciva, Colgate-Palmolive-Peet textile representative; Peter S. Gilchrist Jr., Calco chemist.

### Rounding Out The News

C. A. Moss is with Boston office of John Campbell & Co. He introduced the Campbell line in China in '19 and has spent several years in the Orient. Arthur E. Hirst, formerly with American Printing, later with Imperial Printing & Finishing, later with Carbic Color & Chemical, is now superintendent, Pacific Print Works, Lawrence, Mass. Alfred R. Macormac, professor of textile chemistry, Clemson, is now chemical director Textile Chemical Products, Greensboro, N. C. This company has recently greatly expanded its plant and warehouse facilities. Ivar L. Sjostrom has been elected president, Lawrence (Mass.) Dye Works.

## *Chemical Specialties*

### Packaging Exhibit Awards

Red Circle Coffee Bag, entered by American Coffee Corp., sold by A. & P., designed by Egmont Arens of Calkins & Holden, won the 3rd Wolf Award (a pair of tall, drigold vases), at the 4th Packaging Exposition at the Hotel Astor on March 14. Fifteen additional awards were made in various classes. First place in molded plastic containers went to the hostage package for Lektrolite Cigarette lighter, used by Platinum Products, and designed by Egmont Arens, and made of Catalin (American Catalin Corp). First in Canisters class was a boric acid container designed, entered and used by Montgomery Ward. Valentine & Co.'s self-stirring paint can was picked out from a large number of entries in the group "Displaying Merchandizing Ingenuity Regardless of Adaptation of Art." In the miscellaneous group display stand (Hinde & Dauch), used by Paint Process, and designed by H. L. Kast was selected. "Linit" (Corn Products Refining) was the '31 Wolf Award winner; last year's winner—O'Cedar Wax Cream.

*Coffee took the "cream" away from O'Cedar this year. Above, 2 winners in the group Wolf awards.*

### By Way of Mention

J. B. Ford's packaged Wyandotte cleanser is being publicized in newspaper media in effort to broaden market in western states. New can is 15 oz., instead

of 10 and price is reduced from 15 to 10c. J. Walter Thompson is carrying on a unique comic strip advertising campaign for Leslie-California Salt. "Amazing Facts About Salt" is the title. Pacific Silicate, Berkeley, San Francisco and Los Angeles has been named Coast distributor for Caled Products' dry-cleaners' supplies. "Suds-A-Lot," water softener and cleaner (Suds-A-Lot, Inc., Joliet, Ill.), has inaugurated an intensive advertising campaign. Michigan Alkali has appointed Chemical Sales Agency, Cincinnati, selling agent for "Malium" gas insecticide just perfected. Miracul Wax, St. Louis, has announced an extensive spring advertising campaign for Dri-Brite featherweight floor wax applicators.

### New Containers

Texaco's dry cleaner is now marketed in a black can with white lettering with a bright scarlet molded (Durez) cap. Midway Chemical has redesigned its various packages. Out on the Pacific Coast "Thoro" cleanser has a most attractive new package. Los Angeles Soap has added granules to its line and redesigned all packaging. Iowa Soap, Burlington, has added a pine toilet soap and has done a splendid job of redesigning "Magic Washer" package. Swartz Co., Jeffersonville, Ind., (producers of "Zim" automobile polish) has a new lithographed can. "Brush-On Stove Polish" has been dressed up in a new container. Special closure cap carries a brush to be used for convenience. Brush-On Stove Polish Co., Amesburg, Mass., is the manufacturer.

Revere Copper and Brass' packaged cleaner for brass and other metals was the winner in the fibre cans class in recent *Modern Packaging* All America competition. Out West the California Spray-Chemical Corp., Watsonville, Calif., has had its entire line of packages redesigned by Reginald B. Meller, R. B. Meller Co.

### New Products

Tanglefoot Co., Grand Rapids, Mich., has a new plant spray. Fergusson Laboratories, Philadelphia, is offering a new non-separating metal polish to the jobbing trade for repacking. Norda Essential Oil & Chemical N. Y. City, has a new line of paradichlorbenzene blocks. "Dichloromas" is the trade name. Stanco Distributors, N. Y. City, is marketing "Flit" Powder for elimination of crawling insects. Garfield Manufacturing, Detroit, has just started to market "June Rain," a new quick-sudsing dry soap. Difco Sales, Garfield, N. J., has started to distribute "Difco," a new product for removing paint, varnish, wallpaper, and for cleaning paint brushes. "Hy-Po," a bleach and liquid household cleaner, is being advertised in California and the Southwest by Hygienic Products, Canton, Ohio.

### Exterminators Meet

National Association of Exterminators and Fumigators annual meeting and banquet was held at the New Yorker, N. Y. City, Mar. 26.

### Packaging Machinery Code

Plans are under way for modification of hours and wages provisions of the Code of the Packaging Machinery Industry and Trade, by which hours may be shortened for unskilled and semi-skilled workers and greater flexibility provided for skilled workers in the higher wage brackets which constitute the bottle neck in the specialized packaging machinery companies, according to a resolution adopted at the semi-annual meeting of the Packaging Machinery Industry and Trade on Mar. 12 at the Astor, N. Y. City.

### Soap Flashes

Colgate-Palmolive-Peet launched full hour musical comedy broadcasts over an NBC network on Apr. 3. Walter S. Rapelje, for 15 years general superintendent of Kirkman & Son, Brooklyn, has been made general superintendent for Colgate-Palmolive-Peet, with headquarters in Jersey City. Mr. Rapelje is a Brooklyn Poly man and has been with Kirkman since 1910. "Drene" is a new P. & G. shampoo. Iowa Soap has purchased Dobbins Soap, Camden, N. J., for cash. Plant will be enlarged.

## Metals

*N. Y. Journal of Commerce*, commenting editorially on proposal of certain Western representatives that the government purchase non-ferrous metals for possible war use, states: It is a particularly superfluous suggestion in view of the real progress being made in placing the metal mining industry on a sounder basis. It would be unfortunate indeed to stimulate additional production through such unnecessary government purchases, and thus pave the way for renewed instability in the future. Both here and abroad substantial advances have been made in reducing surplus stocks of non-ferrous metals. This is all the more gratifying because of the tendency displayed in some cases to expand stocks of certain metals at the beginning of the year.

### Jottings

M. de Sincay, Paris zinc cartel president, reports successful operation of the association (continues to July 31).* Copper code failed of support from NRA March 13 and officials of latter suggested a code "not as the final judgment of NRA but merely as a suggestion" N. J. Zinc is closing Ogdensburg, N. J. mine (300 workers) because of high taxes.

*Production quotas remain unchanged.

### Production, Shipments, Stocks of the Metals

| | *February 1934†* | *February 1933†* | *January 1934†* | *January 1933†* | *December 1933†* | *December 1932†* |
|---|---|---|---|---|---|---|
| Copper Production, U. S.‡ | 27,000 | ..... | 18,000 | ..... | ..... | ..... |
| Foreign | 57,000 | ..... | 56,000 | 60,000 | 60,000 | ..... |
| World total | 84,000 | ..... | 91,000 | ..... | ..... | ..... |
| Copper, American stocks | 511,500 | ..... | ..... | ..... | ..... | ..... |
| Copper Deliveries, U. S. | 37,000 | ..... | 32,500 | ..... | ..... | ..... |
| Foreign | 69,500 | ..... | 66,500 | ..... | ..... | ..... |
| World total | 106,500 | ..... | 97,500 | ..... | 93,500 | ..... |
| Copper World Stocks | 612,500 | ..... | ..... | ..... | 640,000 | ..... |
| Lead Production, U. S. | 34,349 | 22,410 | 38,570 | ..... | ..... | ..... |
| World total | ..... | ..... | 122,724 | 105,262 | 134,328 | ..... |
| Lead stocks as month closed | 216,224 | 189,751 | 207,674 | ..... | 203,061 | ..... |
| Lead, domestic shipments | 25,778 | 17,349 | 33,911 | ..... | 26,034 | ..... |
| Zinc Production, U. S. | 30,172 | 19,661 | 32,954 | 18,867 | 32,022 | 18,653 |
| World total | 97,074 | 76,619 | 105,782 | 79,222 | 103,813 | ..... |
| U. S. shipments, slab zinc | 32,054 | 14,865 | 26,532 | 15,162 | 27,685 | 15,745 |
| U. S. zinc, unfilled orders | 26,676 | 8,562 | 26,717 | 6,313 | 15,978 | 8,478 |
| Zinc stocks, U. S. | 110,100 | 133,357 | 111,982 | 128,561 | 105,560 | 124,856 |
| Zinc stocks, cartel | 134,000 | ..... | 154,233 | ..... | 147,975 | ..... |
| U. S. retorts oper. end of period | 30,763 | 23,389 | 28,744 | 22,660 | 27,190 | 21,023 |
| Silver Production, U. S.* | 1,938 | 1,603 | 2,025 | 1,960 | 1,562 | 1,627 |
| World total* | 13,390 | 12,949 | 14,465 | ..... | 12,949 | ..... |
| Tin shipments from cartel countries | ..... | ..... | ..... | ..... | 5,008 | ..... |
| World tin visible supply | 21,694 | 43,160 | 22,476 | ..... | ..... | ..... |

*In oz.; 000 omitted; †long tons; ‡'33 world copper production 902,000 long tons, against 870,000 tons in '32, a gain of 4%. World copper consumption gained 16½%—1,125,000 tons against 965,000 tons.

### Weekly Price Statistics of the Metals

| *Week Ending* | *—Lead, Weekly High-Low— E. St. Louis* | *N. Y.* | *London per ton* | *—Zinc, Weekly High-Low— E. St. Louis* | *N. Y.* | *London per ton* | *Copper Weekly High-Low Conn. Valley* | *—Tin, Weekly— High-Low Straits* | *Standard* | *—Silver Bullion, Weekly— High-Low N. Y.* | *London (pence)* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Close Feb. 28 | .0390 | .040 | £11 15s | .0440 | .0475 | £14 15s | 8c | 52c | 51.25c | 46⅜c | 20 1/16 |
| Mar. 2 | .0390 | .040 | £11 15s | .0440 | .0477– | £14 15s | 8.10 | 52.30–52.05 | 52.10–51.75 | 46⅜–44¼ | 20 11/16–20⅜ |
| | | | £11 7s 6d | | .0475 | £14 8s 9d | | | | | |
| Mar. 9 | .0390 | .040 | £11 13s 9d | .0440 | .0477– | £14 17s 6d | 8 | 53.65–52.50 | 53.55–52.35 | 46⅜–46 | 20⅝–20¼ |
| | | | £11 5s | | .0475 | £14 13s 9d | | | | | |
| Mar. 16 | .0390 | .040 | £11 15s | .0440 | .0477– | £14 15s | 8 | 54.20–54.00 | 54.10–53.875 | 46¾–45½ | 20¾–20 1/16 |
| | | | £11 11s 3d | | .0475 | £14 12s 6d | | | | | |
| Mar. 23 | .0390 | .040 | £11 12s 6d | .0440– | .0477– | £14 15s | 8 | 54.15–53.65 | 54.05–53.55 | 45¾–45¼ | 20¼–19⅞ |
| | | | £11 7s 6d | .0435 | .0472 | £14 11s 3d | | | | | |
| Mar. 30 | .0390 | .040 | £11 13s 9d | .0435– | .0472– | £15 2s 6d | 8 | 55.20–54.45 | 55.05–54.30 | 45⅝–45⅜ | 20 –19 15/16 |
| | | | £11 11s 3d | .0430 | .0465 | £14 15s | | | | | |
| Close Mar. 31 | .0390 | .040 | £11 12s 6d* | .0430 | .0465 | £15 2s 6d* | 8 | 55.25 | 54.60 | 45½ | 19 15/16* |
| Net Change | | | | .0010– | .0010– | | | +3.25 | +3.35 | –⅞ | –⅛ |
| 1934 High-Low | .0390 | .040 | | .0440– | .0475– | | 8½–8 | 55.25–50.37 | 54.60–49.85 | 46¾–43¼ | 20¾–16½ |
| | | | | .0425 | .0460 | | | | | | |

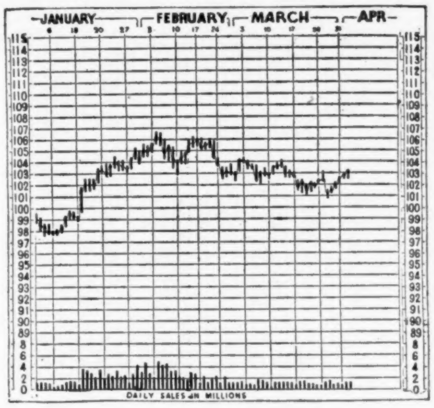
*March 29 last trading day. Zinc dust prices—there is a differential of $0.02 per lb., for carlots above St. Louis zinc market; 5 tons to carloads, $0.0275; less than 5 tons $0.325. Closing prices of other metals; antimony .0765; '34 high-low, .07¼-.0715; mercury close $76.50; high-low, $76.50-$68.00.

# The Financial Markets

## A 1% Decline

Prices declined for the 2nd successive month although the total loss in values amounted to $120,160,969, or less than 1%. This compared with a February depreciation of $643,568,365, or 3%, and a March, '33 gain of $177,172,203 or 1½%. January, '34 gain totaled 11½% ($2,268,904,469).

**Daily Record of Stock Market Trend**




*N. Y. Herald Tribune*

With stock prices now back to around the level of mid-January, the result of trading this year, as gauged by *The Times* index, shows that the gain in values in the 1st quarter amounted to $1,575,412,440, or 8%, compared with a loss of $1,744,761,702, or 14%, in 1st quarter of '33.

## Strikes and Regulation

Prices moved irregularly lower through most of the month. In the last 4 days of trading prices turned upward and wiped out most of the earlier losses. Trading was in very moderate volume reflecting a lack of interest on the part of the general public. Uncertainty caused by the serious threat of strikes throughout the country and also the support given by the administration to the Fletcher-Rayburn Bill (proposed bill to regulate trading) was not the type of news to justify placing of larger commitments. Passage over the President's veto of the Independent Offices Appropriation Bill renewed fear of more drastic inflationary measures and shot prices up near the close of the month.

Following table shows the changes in the 20 groups of the *Times*' Index:

| *Group and Number of Issues* | *March, 1934* Avr. Net Ch'g in Points | *March, 1934* Change in Values |
|---|---|---|
| Amusements (5) | + .450 | +$4,678,422 |
| Building equipment (9) | — .444 | — 2,107,964 |
| Business equipment (4) | — .562 | — 5,594,924 |
| Chain stores (14) | + .384 | + 5,289,944 |
| **Chemicals (9)** | **— .583** | **—35,901,020** |
| Coppers (15) | + .442 | + 5,112,556 |
| Department stores (10) | —1.112 | — 3,608,107 |
| Foods (19) | + .572 | +23,849,973 |
| Leathers 4) | — .969 | — 1,739,450 |
| Mail order (3) | +8.291 | +21,203,784 |
| Motors (15) | — .083 | —10,427,445 |
| Motor equipment (7) | + .411 | + 1,386,059 |
| Oils (22) | + .085 | —63,582,888 |
| Public utilities (29) | — .491 | —47,321,447 |
| Railroads (25) | — .160 | +30,739,544 |
| Railroad equipment (8) | + .344 | + 1,429,933 |
| Rubber (6) | + .062 | + 270,857 |
| Steels (13) | — .731 | —32,629,609 |
| Sugars (9) | — .875 | — 5,195,118 |
| Tobaccos (14) | — .295 | — 6,014,069 |
| Average and total 240 issues | — .040 | —$120,160,969 |

## Monsanto Votes Increase

Chemical stocks moved in opposite directions in March.* Largest loss was shown by du Pont. Outstanding, however, was the gain made in Monsanto. This was in part attributed to the recent announcement of an increase in authorized capital stock to 1,250,000 shares and authorization of issuance of additional shares on Apr. 30 to stockholders of record on Apr. 20 so that each stockholder will receive 1 additional share for each share of stock then held. Additional shares will be charged against paid-in-surplus account. This will call for the issuance of an additional 432,000 shares and will increase capital stock account by $4,320,000.

## May Pay Two Dollars

Following the stockholders' meeting, directors met and re-elected all officers. Edgar M. Queeny, president, had previously stated that it is the Board's intention, providing earnings warrant, to place the new capital stock on a dividend basis of $1 per share per year which is equivalent to $2 per share per year on stock now outstanding.†

*Total value of all chemical stocks on the N. Y. Stock Exchange on Apr. 1 amounted to $3,678,545,149 compared with $3,731,323,629 on Mar. 1, $3,838,756,912 on Feb. 1 and $3,615,566 on Jan. 1.

†Monsanto has recently occupied a prominent place in the chemical financial news. Last month President Queeny reported largest earnings in the Company's history (CHEMICAL INDUSTRIES, Mar. '34, p. 267).

Net value changes in March in the 9 leading chemical common stocks in the *Times*' chemical group follow:

| | |
|---|---|
| Allied Chemical & Dye | *$2,401,288 |
| Commercial Solvents | *4,616,827 |
| Du Pont de Nemours | 38,729,936 |
| Mathieson Alkali Wks | 162,609 |
| Texas Gulf Sulphur | 2,857,500 |
| Union Carbide & Carbon | ........ |
| U. S. Industria lAlcohol | 586,857 |
| Virginia-Carolina Chem | 421,279 |
| Westvaco Chlorine Prod | 160,954 |
| Total | —$35,901,020 |

*Gain, others were losses.

## Allied's Report Analyzed

First Allied annual report to be drafted under agreement made last July was issued Mar. 15. Agreement was reached after prolonged discussions in which the N. Y. Stock Exchange demanded a more detailed report. (CHEMICAL MARKETS, July '33, p. 72).

Net income for '33 was $14,595,521 after depreciation, obsolescence, taxes and other charges. This was equivalent, after payment of preferred dividends, to $5.50 a share on 2,214,099 shares of common in public hands. This reflects change number 1 in report.

For '32 company reported net income of $11,441,189, or $3.62 a share on 2,401,288 common shares—which was the total number issued and did not take into consideration any of its own stock which might have been held by the company. In July, it was revealed that the company has held 187,189 common and 47,309 preferred shares. Holdings were the same on Dec. 31.

Principal changes in report occur in balance sheet, particularly in the manner in which the various forms of investments are carried. Mainly because of this change in bookkeeping, total current assets of the company are down from $150,654,669 to $85,157,024. Current liabilities are shown at $7,250,439 against $8,029,543.

A year ago, an item titled "U. S. Government securities and other marketable securities" was lumped at a cost of $92,404,341. No market-value figure was given. This year, the items are separated. U. S. Government securities at a cost of $21,263,318 are carried in current assets, and a market value of $20,394,288 is shown. An item of marketable securities at a cost of $70,642,881 is carried under investments, outside of the current asset group.

Market value of this block, which includes holdings of the company's own stocks, is shown at $66,171,532. A footnote shows that the company's common stock cost $25,837,300, or $138 a share against a Dec. 31 market price of $148.25, and its preferred stock at $5,640,485, or $119.25 a share, against a Dec. 31 market price of $124.13.

Another change is revealed in the reserve account, which includes for the 1st

**Price Trend of Chemical Company Stocks**

| | Close Feb. 28 | Mar. 2 | Mar. 9 | Mar. 16 | Mar. 23 | Close Mar. 31* | Net Gain or Loss | 1934 High | 1934 Low | 1933 High | 1933 Low |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Allied Chem. | 152 | 154 | 149 | 150½ | 148 | 153 | +1 | 160¾ | 144 | 152 | 70¾ |
| Air Reduction | 98½ | 99 | 98 | 97¼ | 94½ | 95 | —3½ | 106¼ | 93¾ | 112 | 47½ |
| Anaconda | 14¾ | 15⅜ | 15⅜ | 15⅜ | 14⅛ | 15⅞ | + ⅜ | 17⅝ | 13½ | 22⅞ | 5 |
| Col. Carbon | 66 | 67¾ | 68⅜ | 70 | 67⅛ | 67 | +1 | 71 | 58 | 71½ | 23⅛ |
| Com. Solvent | 27¼ | 28⅛ | 27¼ | 27⅜ | 29⅛ | 29 | +1¾ | 36¾ | 26 | 57¼ | 9 |
| duPont | 98⅞ | 100¾ | 96¾ | 97 | 93⅞ | 95⅜ | —3½ | 103⅞ | 90⅝ | 96⅜ | 32⅛ |
| Mathieson | 35½ | 35⅛ | 34⅝ | 34⅝ | 34⅛ | 35¼ | — ¼ | 40¾ | 32¼ | 46⅝ | 14 |
| Monsanto | 77¾ | 76 | 80¼ | 84½ | 84⅛ | 87 | +9¼ | 86⅞ | 75 | 83 | 25 |
| Std. N. J. | 46½ | 47 | 45⅛ | 45 | 45⅛ | 45½ | —1 | 50⅛ | 44⅛ | 47½ | 22¾ |
| Texas Gulf S. | 38⅛ | 38⅝ | 38 | 37⅝ | 35¾ | 37 | —1⅛ | 43¼ | 34½ | 45¼ | 15¼ |
| U. S. I. | 55 | 54¾ | 54½ | 54 | 54¼ | 51½ | —1½ | 64¾ | 50 | 94 | 13½ |

*Last trading day of month.

time an item of $40,000,000 against investments, and one of $13,260,733 for general contingencies. Previously there was an item, amounting in '32 to $55,887,867 for general contingencies. Reserves against depreciation and obsolescence were increased from $129,257,567 to $135,369,746, accounting largely to the increase from $189,762,518 to $195,531,297 in total reserves.

Balance sheet also shows capital surplus unchanged at $61,752,335 and "further" surplus of $96,592,583, against $97,700,436. Under agreement, current report shows that of this further surplus, $35,685,838 represents surplus accrued to the company since its organization and $60-906,745 represents surplus accrued to subsidiaries prior to the company's organization.

Property account is shown at cost, in accordance with terms of the agreement. This item is $221,836,019, against $222,990,044 a year earlier. The letter of Orlando F. Weber, president, also in accordance with the agreement, declares that gross retirements from property account during the year amounted to $2,765,009, of which $1,439,026 was charged to contingency reserves provided in prior years.

Dividends on stock of the company held in its treasury, amounting to $1,454,297 were not included in income. This item appears for the 1st time in the surplus account, as a deduction from total dividends paid. See also page 363 for detailed financial statement; also page 348.

## Bonus Plan Wins Approval

The 31-year-old du Pont bonus plan received almost unanimous approval of stockholders March 12. Of the 11,065,762 shares of common issued, 8,717,083 shares were voted, and of these, only 1,414 withheld approval from the plan.

Several changes in plan recommended by the directors to conform with the National Securities Act received approval.

Management has always regarded these bonus plans as highly contributory to the success of the company. It was decided to resubmit the question of owner-management through the award of bonuses because of recent criticism of bonus plans in general.

Present directors were re-elected, and Henry Belin du Pont was added to the board to fill vacancy caused by death of William Coyne. New director is associated with company's engineering dept., and is secretary of the Christiana Securities Co.

Stockholders approved retirement of 17,387½ shares of voting debenture stock now issued, all of which are in the treasury. These shares are last of an authorized issue of 100,000 shares, and, as a result of their retirement, it was voted to reduce company's capital stock by $10,000,000 which this authorized issue represented.

### Dividends and Dates

| *Name* | *Div.* | *Stock Record* | *Payable* |
|---|---|---|---|
| Abbott Labs. ext. | $0.10 | Mar. 15 | Apr. 1 |
| Abbot Labs...... | .50 | Mar. 15 | Apr. 1 |
| Air Reduction... | .75 | Mar. 31 | Apr. 16 |
| Allied Chem. & Dye.......... | $1.50 | Apr. 11 | May 1 |
| Allied Chem. & Dye pf........ | $1.75 | Mar. 9 | Apr. 2 |
| Am. Glanzst pr pf | .75 | Mar. 23 | Apr. 1 |
| Am. Glanzst 7% pf............ | $1.75 | Mar. 23 | Apr. 1 |
| Am. Glanzst. 7% pf. acc......... | $14.00 | Mar. 23 | Apr. 1 |
| Am. Maize Prods | .25 | Mar. 27 | Mar. 31 |
| Atlas Powder pf. | $1.50 | Apr. 20 | May 1 |
| Can. Cel. 7% cum pf. pt. acc.... | .75 | Mar. 16 | Mar. 31 |
| Can. Cel. 7% cum pf. pt........ | $1.75 | Mar. 16 | Mar. 31 |
| Can. Indus. pf... | $1.75 | Mar. 31 | Apr. 16 |
| Celanese 7% cum. pr. pf........ | $1.75 | Mar. 16 | Apr. 1 |
| Chickasha Cotton Oil spec...... | .50 | Mar. 30 | Apr. 16 |
| Colgate-Palmolive Peet pf....... | $1.50 | Mar. 10 | Apr. 1 |
| Corn Prods. Ref. | .75 | Apr. 2 | Apr. 20 |
| Corn Prods. Ref. pf............ | $1.75 | Apr. 2 | Apr. 16 |
| Devoe & Raynolds A & B........ | .25 | Mar. 21 | Apr. 2 |
| Devoe & Raynolds A & B ext.... | .25 | Mar. 21 | Apr. 2 |
| Devoe & Raynolds 1st pf........ | $1.75 | Mar. 21 | Apr. 2 |
| Devoe & Raynolds 2nd pf........ | $1.75 | Mar. 21 | Apr. 2 |
| DuPont, deb.... | $1.50 | Apr. 10 | Apr. 25 |
| Eastman Kodak. | .75 | Mar. 5 | Apr. 2 |
| Eastman Kodak pf............ | $1.50 | Mar. 5 | Apr. 2 |
| Freeport Tex pf. | $1.50 | Apr. 13 | May 1 |
| Gen. Print. Ink.. | .15 | Mar. 19 | Apr. 2 |
| Gen. Print. Ink pf | $1.50 | Mar. 19 | Apr. 2 |
| Glidden........ | .25 | Mar. 14 | Apr. 2 |
| Glidden pr. pref. | $1.75 | Mar. 14 | Apr. 2 |
| Gold Dust...... | .30 | Apr. 10 | May 1 |
| Gold Dust $6 cv. pf............ | $1.50 | Mar. 17 | Mar. 31 |
| Hazel Atlas Glass | $1.25 | Mar. 17 | Apr. 2 |
| Hercules Powd.. | .50 | Mar. 13 | Mar. 24 |
| Hercules Powd pf | $1.75 | May 4 | May 15 |
| Heyden Chem. pf | $1.75 | Mar. 20 | Apr. 2 |
| Ind. Rayon..... | $1.25 | Mar. 15 | Apr. 1 |
| Int'l Nickel..... | .10 | Mar. 1 | Mar. 31 |
| Int'l Nickel pf... | $1.75 | Apr. 3 | May 1 |
| Int'l Printing Ink pf............ | $1.50 | Apr. 14 | May 1 |
| Int'l Salt....... | .37½ | Mar. 15 | Apr. 2 |
| Koppers Gas & Coke pf...... | $1.50 | Mar. 12 | Apr. 2 |
| Liquid Carbonic. | .25 | Apr. 16 | May 1 |
| MacAndrews & Forbes....... | .50 | Mar. 31 | Apr. 14 |
| MacAndrews & Forbes pf..... | $1.50 | Mar. 31 | Apr. 14 |
| Mathieson Alkali | .37½ | Mar. 7 | Apr. 2 |
| Math. Alkali pf.. | $1.75 | Mar. 8 | Apr. 2 |
| Merck Corp. pf.. | $2.00 | Mar. 17 | Apr. 2 |
| Monroe Chem Co | .50 | Mar. 10 | Mar. 20 |
| Monroe Chem pf. | .87½ | Mar. 15 | Apr. 2 |
| Monsanto Chem. | .31¼ | Feb. 24 | Mar. 15 |
| Monsanto Chem. Co. stock..... | 100% | Apr. 20 | Apr. 30 |
| National Lead... | $1.25 | Mar. 10 | Mar. 31 |
| Nat. Lead pf B.. | $1.50 | Apr. 20 | May 1 |
| Nat Lead pf A... | $1.75 | Mar. 2 | Mar. 15 |
| New Jersey Zinc. | .50 | Apr. 20 | May 10 |
| Paraffine Co..... | .50 | Mar. 17 | Mar. 27 |
| Penick & Ford... | .50 | Mar. 1 | Mar. 15 |
| Penn. Salt Mfg.. | .75 | Mar. 31 | Apr. 14 |
| Pittsburgh Plate Glass......... | .25 | Mar. 10 | Apr. 2 |
| Pittsburgh Plate Glass ext..... | .10 | Mar. 10 | Apr. 2 |
| Pratt & Lambert | .25 | Mar. 15 | Apr. 2 |
| Spencer Kellogg. | .25 | Mar. 15 | Mar. 31 |
| Texas Gulf Sul... | .50 | Mar. 1 | Mar. 15 |
| Union Carbide & Carbon....... | .25 | Mar. 9 | Apr. 2 |
| United Carbon pf | $3.50 | June 16 | July 1 |
| United Carbon pf | $1.75 | Mar. 20 | Apr. 2 |
| United Dyewood pf............ | $1.75 | Mar. 20 | Apr. 2 |
| Vanadium Alloys Steel......... | .25 | Mar. 10 | Mar. 20 |
| Vulcan Detinning pf............ | $1.75 | Apr. 10 | Apr. 20 |
| Vulcan Detinning spec.......... | $3.00 | Apr. 10 | Apr. 20 |
| Westvaco Chlorine Prods. pf..... | $1.75 | Mar. 15 | Apr. 2 |
| Will & Baumer pf | $2.00 | Mar. 21 | Apr. 2 |

### Annual and Special Meetings

| | *Record Date* | *Meeting Date* |
|---|---|---|
| Allied Chem. & Dye...... | Apr. 3 | Apr. 23 |
| Continental Diamond Fibre | Apr. 5 | Apr. 25 |
| National Lead............ | Mar. 29 | Apr. 19 |
| Newport Industries....... | Mar. 27 | Apr. 11 |
| Owens Illinois Glass....... | Mar. 16 | Apr. 18 |
| Union Carbide & Carbon.. | Mar. 9 | Apr. 17 |
| U. S. Ind. Alcohol........ | Apr. 9 | Apr. 19 |

## Solvay-American Redeems

Solvay-American Investment outstanding 15-year 5% secured gold notes, series A, dated March 1, 1927, have been called for payment April 9 at 103 and int. at any 1 of the following designated offices of the following named paying agents of the above corporation viz.: J. P. Morgan & Co., 23 Wall st., N Y. City; White, Weld & Co., 40 Wall st., N. Y. City; or 111 Devonshire st., Boston, Mass.; Lee, Higginson Corp., 50 Federal st., Boston, Mass., or 141 W. Jackson Blvd., Chicago, Ill.

## American Commercial Notifies

American Commercial Alcohol has notified the Exchange that 10,000 shares of common which were to have been issued to Knox B. Phagan in exchange for capital stock of American Distilling, will not be issued and that therefore directors have canceled issuance of 25,000 shares of additional common that were to have been listed under an application dated July 19, '33.

## U. S. I.'s Bonus Plan

U. S. I. stockholders on April 19 will vote upon a plan for additional compensation of officers and employes. Under plan a fund will be set up from annual net earnings in excess of $3 a share on 391,238 shares of capital stock outstanding. Out of net earnings in excess of $3 a share there will be paid into the fund 10c from the 1st dollar; 10c from the 2nd; 10c from the 3rd; 15c from the 4th; 15c from the 5th; 20c from the 6th, and 20c from the 7th

### Over the Counter Prices

| | Jan. 31 | | Feb. 28 | | Mar. 30* | |
|---|---|---|---|---|---|---|
| American Dry Ice, | 1¾ | 4 | 1½ | 3½ | 5 | 9½ |
| American Hard Rubber........ | 6½ | 10 | 9½ | 13½ | 8 | 10½ |
| Canadian Celanese, com.......... | 18 | 20 | 18½ | 20¼ | 18½ | 20½ |
| Canadian Celanese, pfd............ | 104½ | 107½ | 105 | 107½ | 115 | 118¼ |
| Dixon Crucible.. | 40½ | 44½ | 46 | 50½ | 50 | 54 |
| Merck, pfd...... | 107½ | 111 | 116 | 120 | 121 | 126 |
| Tubize Chat., 7%, cum. pfd...... | 57 | ... | 60 | 65½ | 60½ | 65½ |
| Worcester Salt.. | 49 | 53 | 49¼ | 53 | 49 | 53 |
| Young, J. S. pfd. | 85 | ... | 85 | ... | 86 | ... |
| Young, J. S. com. | 60 | 65 | 63 | ... | 66 | ... |
| Int'l Salt 5's, '51. | 89½ | 91½ | 92 | 94½ | 97 | 99½ |

*Last trading day of month.

### Foreign Markets

| **London** | **Jan. 31** | **Feb. 28** | **Mar. 29*** |
|---|---|---|---|
| British Celanese.... | 13s 1½d | 14s 4½d | 14s ½d |
| Celanese.......... | £8½ | £8 | £7⅛ |
| Courtaulds........ | £2⅛ | £2⅝ | 53s 7½d |
| Distillers.......... | 85s 6d | 87s 3d | 88s 9d |
| I. C. I............ | 32s 9d | 35s 4½d | 37s 1½d |
| Unilever, ord...... | £1¼ | £1¼ | 23s 1½d |
| Un. Molasses...... | 21s 3d | 24s | 25s 3d |
| **Paris** | | | |
| Kuhlmann........ | 610 | | 531 |
| L'Air Liquide...... | 720 | 730 | 686 |
| **Berlin** | | | |
| I. G. Farben....... | 125 | 135 | 142 |
| **Milan** | | | |
| Snia Viscosa†...... | 229½ | 239½ | 233 |
| Montecatini....... | 135½ | 140 | 148¼ |

*Last trading day of month.

## *Earnings at a Glance*

| Company | Annual Dividends | Net Income 1934 | Net Income 1933 | Common Share Earnings 1934 | Common Share Earnings 1933 |
|---|---|---|---|---|---|
| Allied Chemical & Dye: | | | | | |
| Year, December 31 | $6.00 | $14,595,521 | $11,441,189 | $5.50 | $3.62 |
| American Cyanamid: | | | | | |
| Year, December 31 | z$.25 | 2,467,682 | $349,725 | c$.99 | c$.14 |
| Amer. Zinz, Lead & Smelt: | | | | | |
| Year, December 31 | f.... | 254,733 | †64,965 | p3.31 | .... |
| Heyden Chemical: | | | | | |
| Year, December 31 | ‡1.00 | 424,783 | 203,600 | 2.68 | 1.21 |
| Merck & Co.: | | | | | |
| Year, December 31 | .... | 1,068,848 | 582,072 | .... | .... |
| Newport Industries: | | | | | |
| Year, December 31 | f..... | 26,832 | †351,274 | .... | .... |
| Union Carbide & Carbon: | | | | | |
| Year, December 31 | 1.00 | 14,172,927 | 8,781,426 | 1.57 | .97 |
| U. S. Industrial Alcohol: | | | | | |
| Year, December 31 | f..... | 1,392,962 | 176,105 | 3.56 | .... |
| U. S. Smelting, R & M: | | | | | |
| Year, December 31 | ‡1.00 | 5,169,875 | 1,995,232 | 6.68 | f.62 |
| Vanadium Corp. of Amer.: | | | | | |
| Year, December 31 | f..... | †905,560 | †1,651,959 | .... | .... |
| Vulcan Detinning Co.: | | | | | |
| December 31 quarter | z3.00 | 139,031 | 24,748 | 3.46 | p1.57 |
| Year, December 31 | z3.00 | 304,421 | 114,572 | 6.04 | .13 |

zLast dividend declared—period not announced by company; cOn combined Class A, and Class B shares; fNo common dividends; †Net loss; pOn preferred stock; ‡Plus extras.

## *Company Reports*

### Union Carbide Nets $1.57 a Share

Union Carbide & Carbon and subsidiaries for year ended Dec. 31, certified by independent auditors, shows net income of $14,172,927 after federal taxes, depreciation, depletion, interest and subsidiary preferred dividends, equivalent to $1.57 a share on 9,000,743 no-par shares of stock, including 97,605 shares held by the company. This compares with $8,781,426 or 97c a share in '32.

Consolidated income account for '33, compares as follows:

| | 1933 | 1932 | 1931 | 1930 |
|---|---|---|---|---|
| Net after federal tax | $21,958,637 | $16,865,074 | $26,076,680 | $37,002,705 |
| Depr & depl | 6,285,638 | 6,178,425 | 6,049,658 | 7,248,526 |
| Other charges | 285,998 | 672,722 | 737,050 | 564,406 |
| Interest | 677,396 | 695,823 | 723,772 | 611,670 |
| Sub pfd divs | 536,678 | 536,678 | 536,678 | 536,678 |
| Net income | $14,172,927 | $8,781,426 | $18,029,522 | $28,041,425 |
| Dividends | 8,908,013 | 12,601,040 | 23,401,932 | 23,395,734 |
| Surplus | $5,264,914 | *$3,819,614 | *$5,372,410 | $4,645,691 |
| P & L surpl | 41,605,829 | 36,381,724 | 43,659,274 | 98,579,703 |

*Deficit.

International Nickel reports a net profit of $9,662,583 after charges, taxes, depreciation and depletion. This was equal, after preferred dividend payments, to 53c a share on 14,584,025 outstanding common shares of no-par value. Exchange adjustments and profit for year amounting to $1,739,617 were carried to contingent reserve increasing it to $7,529,226 from $5,403,152. For '32, company had reported a net loss of $135,344, which included losses on exchange.

Merck and subsidiaries, in report for year ended Dec. 31, '33, (certified by independent auditors) shows net income of $1,068,848 after charges, depreciation, federal taxes, etc., comparing with $582,072 in 1932.

Pittsburgh Plate Glass in report for year ended Dec. 31 '33, certified by independent auditors, shows net profit of $3,993,933 after depreciation, obsolescence, depletion, federal taxes, and provision for loss on deposits in closed banks, equal to $1.86 a share (par $25) on 2,140,805 shares of capital stock. This compares with net loss of $60,737 in '32.

Current assets as of Dec. 31, '33, including $10,343,718 cash, and marketable securities, amounted to $29,444,238 and current liabilities were $3,667,179 compared with cash, and marketable securities of $10,578,168, current assets of $29,673,635 and current liabilities of $2,001,659 at end of preceding year.

### Cyanamid's Earnings Rise Sharply

American Cyanamid and subsidiaries for year ended Dec. 31, '33, certified by independent auditors, shows consolidated net profit of $2,467,682 after depreciation, depletion, interest, federal taxes, minority interest, etc., equivalent to 99c a share (par $10) on combined 2,490,373 shares of Class A and B common outstanding at end of period, including shares reserved for stocks not yet presented for exchange, but excluding 187,669 Class B shares held by subsidiaries. This compares with consolidated net profit in '32, of $349,725 equal to 14c a share on combined 2,470,137 Class A and B common stocks, excluding 207,905 Class B shares held by subsidiaries.

Current assets as of Dec. 31, '33, including $6,102,565 cash, and marketable securities at market amounted to $19,463,719 and current liabilities were $4,361,640 compared with cash and marketable securities of $5,783,506, current assets of $16,457,244 and current liabilities of $2,299,426 at end of preceding year. Consolidated income account for year 1933 compares as follows:

| | 1933 | 1932 |
|---|---|---|
| Operating profit | $4,849,612 | $3,094,064 |
| Divs, int and discount | 336,280 | 239,201 |
| Profit realized on foreign exch | 386,105 | ...... |
| Royalties, licenses, etc | 42,819 | 41,946 |
| Other income | 79,519 | 78,956 |
| Total income | $5,694,335 | $3,454,167 |
| Depreciation and depletion | 1,609,631 | 1,551,156 |
| Research and process dev exp | 1,053,932 | 1,176,028 |
| Interest | 302,521 | 289,912 |
| Federal taxes | 171,196 | 3,346 |
| Minority interest | 89,373 | 84,000 |
| Net profit | $2,467,682 | $349,725 |

### Allied's Financial Report Digested

Allied Chemical consolidated income account for '33, compares as follows:*

| | 1933 | 1932 | 1931 | 1930 |
|---|---|---|---|---|
| *Gross inc | $16,620,763 | $12,730,108 | $20,779,031 | $27,886,685 |
| Fed tax | 2,025,242 | 1,288,919 | 1,847,521 | 2,783,146 |
| Net inc | $14,595,521 | $11,441,189 | $18,931,510 | $25,103,539 |
| Pfd divs | ‡2,418,780 | 2,749,943 | 2,749,943 | 2,749,943 |
| Com divs | ‡13,284,594 | 14,407,727 | 14,574,235 | 13,881,526 |
| Deficit | $1,107,853 | $5,716,481 | †$1,607,332 | †88,472,070 |
| Prev. surp | 159,452,771 | 165,169,252 | 204,133,460 | 196,205,745 |
| Total surp | $158,344,918 | $159,452,771 | $205,740,792 | $204,677,815 |
| Stks divs | ........ | ........ | 571,540 | 544,355 |
| Tr to cont res | ........ | ........ | 40,000,000 | ........ |
| P&L surp | $158,344,918 | $159,452,771 | $165,169,252 | $204,133,460 |

*After expenses, depreciation, ordinary taxes, etc. †Surplus. ‡Excludes dividends on stock owned by company.

Consolidated balance sheet of Allied, as of Dec. 31, '33, compares as follows:

| Assets | 1933 | 1932 | 1931 |
|---|---|---|---|
| R E pits eq mines etc | $221,836,019 | $222,990,044 | $223,068,894 |
| Sundry investments | 12,827,704 | 12,692,510 | 10,413,770 |
| Cash | 27,271,548 | 25,883,393 | 20,012,912 |
| U S gov't sec at cost | §21,263,318 | 92,404,341 | 94,638,155 |
| Marketable sec at cost | ‡70,642,881 | | |
| Accts and notes rec | 13,743,568 | 9,721,720 | 11,188,465 |
| Inventories | 22,878,590 | 22,645,245 | 26,568,292 |
| Patents dgwl, etc | 21,305,943 | 21,305,943 | 21,305,942 |
| Deferred charges | 648,424 | 892,885 | 853,372 |
| Total | $412,417,995 | $408,536,081 | $408,049,802 |
| **Liabilities** | | | |
| †Preferred stock | $39,284,900 | $39,284,900 | $39,284,900 |
| *Common stock | 12,006,440 | 12,006,440 | 12,006,440 |
| Dividends payable | 4,289,418 | 4,289,418 | 4,289,418 |
| Accounts payable | 2,718,493 | 1,827,848 | 2,541,674 |
| Accrued wages | 242,528 | 180,907 | 163,449 |
| Depre res etc | 135,369,476 | 129,257,567 | 122,746,940 |
| Investment reserves | 40,000,000 | ....... | ....... |
| Gen contingent reserve | 13,260,733 | 55,887,867 | 54,731,268 |
| Tax reserve | 2,556,973 | 1,731,372 | 2,345,766 |
| Insurance reserve | 2,296,960 | 2,269,316 | 2,303,470 |
| Other reserve | 2,046,886 | 2,347,675 | 2,467,225 |
| Capital surplus | 61,752,335 | 61,752,335 | 61,752,335 |
| Other surplus | 96,592,583 | 97,700,436 | 103,416,917 |
| Total | $412,417,995 | $408,536,081 | $408,049,802 |

*Represented by 2,401,288 no-par shares carried at $5 per share, including shares held by company. †Includes shares held by company. ‡All listed on New York Stock Exchange or New York Curb Exchange, and including 187,189 shares of company's common stock at cost of $25,837,300 and 47,309 shares of company's preferred stock at cost of $5,640,485. Total value of marketable securities at December 31, 1933, was $66,171,532. §Market value on December 31, 1933, was $20,394,288.

*For further details and analysis of this important financial statement see page 361 this issue.

# The Industry's Securities

| 1934 March Last | 1934 March High | 1934 March Low | 1933 High | 1933 Low | 1932 High | 1932 Low | Sales In March | Sales During 1934 | Stocks | Par $ | Shares Listed | An. Rate | Earnings $-per share-$ 1933 | Earnings $-per share-$ 1932 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| March 31 | | | | | | | Number of Shares | | | | | | | |
| NEW YORK STOCK EXCHANGE | | | | | | | | | | | | | | |
| 95 | 106½ | 93½ | 112 | 47½ | 63½ | 30⅞ | 14,800 | 55,900 | Air Reduction | No | 841,288 | $3.00* | 3.79 | 2.73 |
| 153 | 160⅛ | 144 | 152 | 70¾ | 88¼ | 42½ | 24,000 | 102,700 | Allied Chem. & Dye | No | 2,214,099 | 6.00 | 5.50 | 3.62 |
| 126 | 126¼ | 122¼ | 125 | 115 | 120† | 96½ | 1,500 | 3,900 | 7% cum. pfd. | 100 | 345,540 | 7.00 | 42.24 | 29.12 |
| 27 | 36 | 25¼ | 35 | 7¼ | 15½ | 3½ | 12,900 | 83,400 | Amer. Agric. Chem. | 100 | 315,701 | None | | —p3.86 |
| 49½ | 62½ | 47 | 89⅞ | 13 | 27 | 11 | 40,600 | 330,800 | Amer. Com. Alcohol | 20 | 260,716 | None | 4.56 | 3.01 |
| 30 | 32⅞ | 26¼ | 29¼ | 9¾ | 15½ | 7 | 10,900 | 28,600 | Archer-Dan.-Midland | No | 541,546 | 1.00 | 1.82 | q1.44 |
| 50 | 55½ | 35¼ | 39½ | 9 | 25½ | 7 | 11,200 | 39,100 | Atlas Powder Co | No | 234,235 | 2.00 | .74 | —2.06 |
| 96½ | 98¼ | 83 | 83½ | 60 | 79½ | 45½ | 1,160 | 2,560 | 6% cum. pfd. | 100 | 88.781 | 6.00 | 8.38 | .47 |
| 37 | 44½ | 33⅞ | 58⅞ | 4½ | 12⅞ | 1½ | 104,900 | 547,300 | Celanese Corp. Amer. | No | 987,800 | None | 3.32 | — .95 |
| 16⅜ | 18⅛ | 9⅜ | 22⅝ | 7 | 31½ | 10¼ | 120,600 | 379,600 | Colgate Palm-Peet | No | 1,985,812 | None | — .57 | — .74 |
| 85 | 86 | 68½ | 88 | 49 | 95 | 65 | 1,600 | 3,000 | 6% pfd. | 100 | 254,500 | 6.00 | 1.51 | .21 |
| 67 | 71 | 58 | 71½ | 23⅛ | 41⅞ | 13½ | 32,800 | 106,600 | Columbian Carbon | No | 538,154 | 2.00 | 2.17 | 1.83 |
| 29 | 36¾ | 26 | 57¼ | 9 | 13¾ | 3½ | 176,100 | 1,533,100 | Commer. Solvents | No. | 2,635,371 | .60 | .88 | .51 |
| 72 | 84½ | 69¼ | 90⅝ | 45⅜ | 55⅜ | 24¾ | 27,300 | 111,500 | Corn Products | 25 | 2,530,000 | 3.00 | 3.87 | 2.77 |
| 140½ | 144 | 135 | 145¾ | 117½ | 140 | 99½ | 1,090 | 2,410 | 7% cum. pfd. | 100 | 243,739 | 7.00 | 46.02 | 35.05 |
| 44½ | 49¾ | 29 | 33⅞ | 10 | 16¾ | 7 | 3,800 | 37,500 | Devoe & Rayn. A | No | 95,000 | h1.00 | | —r1.00 |
| 95⅜ | 103⅞ | 90⅝ | 95⅞ | 32⅛ | 59¾ | 22 | 142,300 | 662,700 | DuPont de Nemours | 20 | 10,871,997 | i2.00 | 2.93 | 1.81 |
| 120½ | 119¼ | 115 | 117 | 97½ | 105⅛ | 80¾ | 5,300 | 15,200 | 6% cum. deb. | 100 | 1,092,699 | 6.00 | 35.58 | 24.00 |
| 86¾ | 93¾ | 79 | 89¾ | 46 | 87¾ | 35¼ | 22,500 | 80,100 | Eastman Kodak | No | 2,250,921 | 3.00 | 4.76 | 2.52 |
| 132 | 133½ | 120 | 130 | 110 | 125 | 99 | 170 | 820 | 6% cum. pfd. | 100 | 61,657 | 6.00 | 180.34 | 98.27 |
| 44¼ | 50¾ | 43⅜ | 49⅜ | 16½ | 28⅝ | 10 | 31,200 | 109,500 | Freeport Texas | 10 | 784,664 | 2.00 | 3.01 | 2.75 |
| 155 | 160⅛ | 150⅛ | 160⅛ | 97 | ... | ... | 100 | 1,600 | 6% conv. pfd. | 100 | 25,000 | 6.00 | 156.73 | |
| 24⅜ | 25 | 15⅝ | 20 | 3¾ | 10⅜ | 3⅛ | 86,700 | 294,000 | Glidden Co. | No | 603,304 | 1.00 | 1.54 | —s.06 |
| 98¼ | 99½ | 83 | 91½ | 48 | 76 | 35 | 1,250 | 4,565 | Glidden, pr. pfd. | 100 | 63,044 | 7.00 | 22.60 | 7.85 |
| 88 | 96¾ | 86¼ | 85⅞ | 65 | ... | ... | 5,100 | 15,700 | Hazel Atlas | 25 | 434,409 | 5.00 | 6.22 | 4.68 |
| 68 | 71 | 59 | 68⅜ | 15 | 29½ | 13⅞ | 8,600 | 31,800 | Hercules Powder | No | 582,679 | 2.00 | 2.79 | 24 |
| 117¼ | 120 | 111 | 110⅛ | 85 | 95 | 70½ | 280 | 810 | 7% cum. pfd. | 100 | 105,765 | 7.00 | 22.38 | 8.39 |
| 81 | 96⅜ | 74¾ | 85 | 24 | 40 | 7⅛ | 19,500 | 96,100 | Industrial Rayon | No | 200,000 | 4.00 | 9.03 | 1.64 |
| 4⅝ | 6⅛ | 2 | 5⅞ | ⅞ | 3½ | ½ | 15,200 | 168,100 | Intern. Agricul. | No | 436,049 | None | —4.04 | —q4.47 |
| 31 | 37¼ | 15 | 23½ | 5 | 15 | 3¾ | 2,900 | 20,600 | 7% cum. pr. pfd. | 100 | 100,000 | None | | |
| 28¼ | 28¼ | 21 | 23¼ | 6¾ | 12½ | 3½ | 702,800 | 1,507,700 | Intern. Nickel | No | 14,584,025 | None | .53 | — .14 |
| 26⅞ | 25¼ | 21 | 27¾ | 13¾ | 23½ | 9¾ | 7,200 | 17,400 | Intern. Salt | No | 240,000 | 1.50 | 2.04 | 2.14 |
| 21 | 24½ | 15¾ | 22 | 7½ | 11 | 8 | 7,100 | 26,700 | Kellogg (Spencer) | No | 500,000 | 1.00 | .98 | —v.26 |
| 36¼ | 43⅞ | 34½ | 37⅜ | 4⅜ | 9⅜ | 3¾ | 81,700 | 512,000 | Libby Owens Ford | No | 2,559,042 | 1.20 | 1.64 | — .13 |
| 27⅛ | 32½ | 27 | 50 | 10¼ | 22 | 9 | 16,000 | 78,800 | Liquid Carbonic | No | 342,406 | 1.00 | | —u1.29 |
| 35¼ | 40¾ | 32¼ | 46⅝ | 14 | 20⅞ | 9 | 30,900 | 282,800 | Mathieson Alkali | No | t650,436 | 1.50 | 1.70 | .86 |
| 87 | 86⅞ | 75 | 83 | 25 | 30¾ | 13⅜ | 18,900 | 35,200 | Monsanto Chem. | 10 | 427,116 | k1.25 | 5.14 | 2.37 |
| 140 | 141½ | 136 | 140 | 43¼ | 92 | 45 | 1,400 | 4,900 | National Lead | 100 | 309,831 | 5.00 | | 3.15 |
| 139 | 140 | 122 | 128¼ | 101 | 125 | 87 | 200 | 1,700 | 7% cum. "A" pfd. | 100 | 243,676 | 7.00 | | |
| 102 | 103 | 100⅛ | 109⅛ | 75 | 105 | 61 | 200 | 1,000 | 6% cum. "B" pfd. | 100 | 103,277 | 6.00 | | |
| 10¾ | 13 | 6 | 11¾ | 1⅜ | 3¾ | 1½ | 48,800 | 88,300 | Newport Industries | 1 | 519,347 | None | .05 | — .68 |
| 83 | 94 | 78¼ | 96¾ | 31½ | 42¼ | 12 | 10,300 | 65,700 | Owens-Illinois Glass | 25 | 1,200,000 | 3.00 | 4.86 | 1.62 |
| 34⅝ | 41¼ | 36 | 47½ | 19⅝ | 42¾ | 19⅞ | 29,000 | 107,600 | Procter & Gamble | No | 6,410,000 | 1.50 | 1.52 | q1.26 |
| 106½ | 106½ | 102¼ | 110¾ | 97 | 103½ | 81 | 1,220 | 3,075 | 5% pfd. (ser. 2-1-29) | 100 | 171,569 | 5.00 | 61.95 | 52.16 |
| 5⅛ | 6¾ | 4⅛ | 7¼ | 1⅜ | 4⅞ | 1 | 8,000 | 46,400 | Tenn. Corp. | 5 | 857,896 | None | | — .89 |
| 37 | 43½ | 34½ | 45¼ | 15¼ | 26¾ | 12 | 71,500 | 311,400 | Texas Gulf Sulphur | No | 2,540,000 | 2.00 | 2.93 | 2.33 |
| 44½ | 50⅞ | 41½ | 51⅞ | 19¾ | 36⅜ | 15½ | 108,800 | 468,900 | Union Carbide & Carbon | No | 9,000,743 | 1.00 | 1.59 | .98 |
| 38 | 40⅜ | 35 | 37¾ | 10¼ | 18 | 6⅝ | 9,200 | 66,300 | United Carbon | No | 370,127 | 1.60 | 1.39 | — .05 |
| 51½ | 64¾ | 50 | 94 | 13½ | 36¼ | 13¼ | 16,600 | 182,100 | U. S. Indus. Alco. | No | 391,033 | None | 3.56 | .47 |
| 27 | 31½ | 21 | 36½ | 7⅜ | 23¾ | 5¼ | 61,800 | 249,800 | Vanadium Corp.-Amer. | No | 366,637 | None | —2.40 | —4.36 |
| 3¾ | 5⅜ | 3⅛ | 7⅜ | ⅜ | 2⅜ | ½ | 8,900 | 73,900 | Virginia-Caro. Chem. | No | 486,000 | None | —4.93 | —q5.73 |
| 20 | 26 | 14½ | 26½ | 3⅜ | 11¼ | 3⅛ | 2,400 | 27,600 | 6% cum. pact. pfd. | 100 | 213,392 | None | | |
| 75 | 75 | 59¾ | 63½ | 35⅜ | 69¾ | 20 | 500 | 1,700 | 7% cum. prior pfd. | 100 | 60,000 | None | | |
| 22 | 27¼ | 14⅞ | 20½ | 5 | 12⅜ | 3 | 10,600 | 87,000 | Westvaco Chlorine | No | 284,962 | .40 | 1.08 | .79 |
| NEW YORK CURB EXCHANGE | | | | | | | | | | | | | | |
| 18⅜ | 20⅜ | 15⅛ | 16½ | 3¼ | 8½ | 1⅜ | 67,100 | 326,100 | Amer. Cyanamid "B" | No | 2,404,194 | m1.00 | .99 | .14 |
| 3⅝ | 4⅛ | 3⅛ | 4⅛ | 1 | 2¼ | ¾ | 5,800 | 21,400 | British Celanese Am. R.C.R. | 243 | | None | | |
| 98 | 103¼ | 93½ | 110 | 27 | 55 | 8 | 2,925 | 6,150 | Celanese, 7% cum. 1st pfd | 100 | 144,379 | 7.00 | 32.24 | .60 |
| 94¾ | 96 | 83 | 90 | 51 | 64¼ | 17 | 275 | 2,525 | 7% cum. prior pfd. | 100 | 113,668 | 7.00 | 47.98 | 7.77 |
| 13½ | 19 | 12½ | 26⅞ | 2 | 5⅜ | 1½ | 2,600 | 6,125 | Celluloid Corp. | 15 | 194,952 | None | —1.00 | —3.79 |
| 12½ | 12¾ | 10½ | 11⅜ | 4⅛ | 6⅛ | 4½ | 2,000 | 11,400 | Courtaulds' Ltd. | 1£ | 24,000,000 | 4¼% | | w.26 |
| 70¼ | 77½ | 69¼ | 78 | 30 | 39 | 21½ | 2,400 | 8,400 | Dow Chemical | No | 630,000 | 2.00 | 1.99 | 2.95 |
| 5½ | 6¾ | 4 | 8 | ½ | 1½ | ½ | 3,100 | 15,300 | Duval Texas Sulphur | No | 500,000 | None | | s.30 |
| 25½ | 26 | 19 | 19 | 8 | ... | ... | 2,300 | 4,200 | Heyden Chem. Corp. | 10 | 147,600 | 1.00 | 2.68 | 1.23 |
| 49¾ | 50⅜ | 39 | 39⅞ | 13 | 19½ | 12⅛ | 11,175 | 56,500 | Pittsburgh Plate Glass | 25 | 2,141,305 | 1.00 | 1.87 | — .03 |
| 61 | 66¾ | 47¼ | 47 | 12⅞ | 35 | 17½ | 14,240 | 59,190 | Sherwin Williams | 25 | 635,583 | 2.00 | y3.54 | — .44 |
| 104½ | 107¾ | 100 | 99 | 80 | 100⅛ | 75 | 410 | 850 | 6% pfd. AA. cum. | 100 | 155,521 | 6.00 | y20.78 | 4.52 |
| CLEVELAND STOCK EXCHANGE | | | | | | | | | | | | | | |
| 70½ | 76½ | 70½ | 78 | 30 | 40 | 21½ | 700 | 3,475 | Dow Chemical | No | 630,000 | 2.00 | 1.99 | f2.95 |
| PHILADELPHIA STOCK EXCHANGE | | | | | | | | | | | | | | |
| ... | 61¼ | 56 | 57 | 25¼ | 40 | 19⅞ | 100 | 675 | Pennsylvania Salt | 50 | 150,000 | 3.00 | 2.17 | 2.42 |

| 1934 March Last | 1934 March High | 1934 March Low | 1933 High | 1933 Low | 1932 High | 1932 Low | Sales In March | Sales During 1934 | Bonds | Date Due | Int. % | Int. Period | Out-standing $ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| March 31 | | | | | | | | | | | | | |
| NEW YORK STOCK EXCHANGE | | | | | | | | | | | | | |
| 101 | 101¼ | 93½ | 95 | 70½ | 80 | 62 | 212,000 | 650,000 | Amer. Cyan. deb. 5's | 1942 | 5 | A. O. | 4,411,000 |
| 94½ | 96¼ | 83⅞ | 89 | 64 | 80 | 54¼ | 721,000 | 1,751,000 | Amer. I. G. Chem. Conv. 5½'s | 1949 | 5½ | M. N. | 29,929,000 |
| 11 | 13⅝ | 5 | 14⅛ | 2⅛ | 18 | 1 | 268,000 | 1,452,000 | Anglo Chilean s. f. deb. 7's | 1945 | 7 | M. N. | 12,700,000 |
| 80 | 83 | 61½ | 74⅛ | 37 | 60 | 34½ | 29,000 | 203,000 | By-Products Coke Corp. 1st. 5½'s "A" | 1945 | 5½ | M. N. | 4,932,000 |
| 100½ | 101⅝ | 100½ | 104½ | 100½ | 104⅞ | 100⅜ | 16,000 | 49,000 | Corn Prod. Refin. 1st. s. f. 5's | 1934 | 5 | M. N. | 1,766,000 |
| 75½ | 77 | 62 | 65 | 38½ | 54⅛ | 32 | 43,000 | 80,000 | Int. Agric. Corp. 1st. Coll. tr. stamped to 1942 | 1942 | 5½ | M. N. | 5,994,100 |
| 12⅛ | 16 | 5⅛ | 14⅞ | 2½ | 15¼ | ½ | 1,172,000 | 4,399,000 | Lautaro Nitrate conv. b's | 1954 | 6 | J. J. | 31,357,000 |
| 97¼ | 98½ | 96 | 99⅛ | 87 | 97¾ | 67 | 95,000 | 312,000 | Montecatini Min. & Agric. det. 7's with warrants | 1937 | 7 | J. J. | 7,075,045 |
| 61 | 74 | 52½ | 62 | 33¾ | 59 | 17 | 89,000 | 278,000 | Ruhr Chem. 6's | 1948 | 6 | A. O. | 3,156,000 |
| 102⅞ | 104 | 98 | 99½ | 87 | 90 | 66 | 149,000 | 311,000 | Solvay Am. Invest. 5% notes | 1942 | 5 | M. S. | 10,062,000 |
| 80½ | 80½ | 65½ | 76 | 50 | 66 | 39 | 5,000 | 54,000 | Tenn. Corp. deb. 6's "B" | 1944 | 6 | M. S. | 3,007,900 |
| 80½ | 85 | 62 | 81 | 34¾ | 75 | 30 | 226,000 | 821,000 | Vanadium Corp. conv. 5's | 1941 | 5 | A. O. | 4,261,000 |
| NEW YORK CURB EXCHANGE | | | | | | | | | | | | | |
| 102 | 102 | 101⅜ | 103½ | 101½ | 103⅛ | 99 | 14,000 | 43,000 | Westvaco Chlorine Prod. 5½'s | 1937 | 5½ | M. S. | 1,393,000 |

*Plus 75c extra; fYears ended 5-31-32-& 33; hPlus 25c ended 5-31-32-& 33; iPlus 75c ended 5-31-32-& 33; jPlus 75c ended 5-31-32-& 33; kPlus 75c ended 5-31-32-& 33; mIf rate of last quarter be cont.; pYear ended 6-30-32; qYears ended 6-30-32 & 6-30-33; rYear ended 11-30-32; sYears ended 10-31-32 & 33; tBefore issue, rights; uYear ended 9-30-32; vYears ended 9-2-32 & 33; w@ $4,866 to the £; xYears ended 5-31-32 & 33; yYear ended 8-31-33; zYear ended 8-13-32.

# The Trend of Prices

## Business Forges Ahead

Despite adverse weather in most sections immediately preceding Easter, retail buying was the heaviest for similar periods in the last 3 years. Increase in average weekly earnings of 4.9% in February more than offset rise of 1% in cost of living, bringing wage-earners' weekly envelope up to 95% of the '23 average. With report after report in March of higher wage scales announced by large companies and small alike, there can be little doubt that this favorable movement extended into March. Wholesale buying has kept pace with retail, and in many lines actual shortages of goods were reported. Over a wide area it was estimated by the *Financial Chronicle* that retail sales were 35 to 60% ahead of the same period a year ago and 10 to 12% ahead of 2 years ago. It must be remembered, however, that March of '33 saw every bank in the country with closed doors.

Business suffered 2 bad frights in the past month when for several days it appeared that the country was about to suffer a serious epidemic of strikes with the automotive workers taking the lead. Happily the well-known ability of the President to smooth "troubled waters" again proved successful, and business after relapsing into the doldrums for a week speedily picked up where it had left off. Unfortunately over-riding of the Presidential veto of the Offices Appropriation Bill was final and left the country with the genuine fear of radical inflationary measures. To an unknown degree this brought in buying of stocks and commodities.

Heavy industries were active. Auto producers are thought to have turned out over 300,000 units, largest production in 3 years. With a possibility of a strike manufacturers pushed up schedules even higher than originally planned. Steel activity continued above 45% compared with 14.8% last year and 9% at the lowest point in the depression. Steel Corporation has 200,000 at work, the number being only 20,000 below the '29 peak, with the basic pay rate up 25% over last July. Cotton spindles operated in February at 101.5% of capacity, comparing with 98.5% for January and 94.9% in February, '33. Preliminary estimates place March ahead of February, '34. Other industries, glass, tanning, paints (all large chemical buyers) continued to expand operations. Some uncertainty was reported from Akron tire section, due to the threatened automotive workers' strike.

The *Times'* weekly business index reached a new high, covering period back to mid-August, '33 and the *Journal of Commerce's* business index set a new recovery record that broke through last year's high point, reached in July, and reached the highest level since May, '31. Generally speaking it is safe to say that the country is back at '31 manufacturing levels.

Movement in commodity prices was mixed, reflecting largely the uncertainty aroused by the Detroit situation and the long-term possibilities of fresh inflationary measures of a more radical type. The country suddenly awoke to the realization that Congress might demand a more active part in shaping policies. A more optimistic viewpoint taken in many quarters was that it was an election gesture and that the $228,000,000 added to the budget was small at a time when billions are spoken of and that in some way (probably additional taxes) the money would be found. Further long-term uncertainty was caused by the likelihood of the final passage of the tariff measure asked for by the President, permitting him wide discretionary powers in the matter of lowering or raising rates.

Chemical consumption and production expanded in March although totals were somewhat below earlier expectations. Prices were steady with comparatively few changes. April chemical consumption is expected, a consensus of opinion among leading manufacturers discloses, to equal March. Heavy seasonal expansion is looked for in the paint industry and in the rayon and textile fields, with but slight changes in petroleum, glass, plastics, tanning, soap, rubber, and metals refining. Agricultural insecticide tonnage is expected to be good.

### Month's Business Statistics

| | February 1934 | February 1933 | January 1934 | January 1933 | December 1933 | December 1932 |
|---|---|---|---|---|---|---|
| Auto production | 235,376 | 106,888 | 161,086 | 130,087 | 84,045 | 107,353 |
| Bldg. contracts*† | $96,716 | $52,712 | $186,463 | ....... | $207,209 | $81,219 |
| Cotton Consumption, bales | 477,890 | 441,203 | 508,034 | 470,182 | 348,393 | 440,439 |
| Factory employment† | ....... | ....... | 70.5 | 58.1 | 70.1 | 58.3 |
| Payroll totals† | ....... | ....... | 52.9 | 39.2 | 49.8 | 37.7 |
| Failures Dun & Brad | 1,049 | 2,378 | 1,364 | 2,919 | 1,132 | 2,409 |
| Merch. imports‡ | ....... | ....... | $129,000 | $95,993 | $133,000 | $97,087 |
| Merch. exports‡ | $162,805 | $101,515 | $169,531 | $118,559 | $192,000 | $131,614 |
| Newsprint Product: | | | | | | |
| Canada, tons | 174,447 | 125,916 | 188,374 | 140,539 | 175,304 | 138,685 |
| U. S., tons | 72,402 | 67,085 | 84,194 | 74,444 | 80,895 | 80,072 |
| Newfoundland, tons | 22,038 | 17,474 | 25,477 | 33,207 | 26,030 | 21,704 |
| Total | 246,849 | 211,301 | 297,278 | 238,598 | 283,833 | 241,365 |
| Newsprint Ship: | | | | | | |
| Canada, tons | 169,054 | 120,916 | 187,352 | 133,056 | 172,285 | 140,770 |
| U. S., tons | 69,251 | 67,057 | 84,796 | 72,725 | 82,031 | 79,002 |
| Total (Can. & U.S.) | 238,305 | 187,973 | 272,148 | 205,781 | 254,316 | 219,772 |
| Newsprint Stocks: | | | | | | |
| Canada, tons | 40,445 | 54,515 | 34,711 | 41,337 | 33,847 | 54,214 |
| U. S., tons | 22,060 | 23,363 | 17,184 | 21,783 | 18,566 | 32,709 |
| Total (Can. & U.S.) | 62,505 | 77,878 | 52,495 | 64,137 | 52,413 | 86,923 |
| Plate glass output, sq. ft. | ....... | ....... | 7,607,195 | 6,188,263 | 6,346,645 | 4,267,809 |
| Shoe production, pairs | 29,000,000 | 26,384,000 | 25,180,079 | 22,716,815 | 20,094,994 | ....... |
| Steel ingots *b* | 2,213,569 | 1,086,867 | 1,996,897 | 1,030,075 | 1,819,648 | 861,034 |
| Tire shipments | ....... | ....... | ....... | ....... | 3,531,121 | 1,818,700 |
| " production | ....... | ....... | ....... | ....... | 3,081,886 | 1,982,681 |
| " inventory | ....... | ....... | ....... | ....... | 8,888,070 | 7,644,359 |
| *Chemical* | | | | | | |
| Elect. energy consumpt. *a* | ....... | ....... | ....... | ....... | ....... | ....... |
| Stocks, mfg. goods *a* | ....... | ....... | ....... | ....... | ....... | ....... |
| Stocks, raw materials *a* | ....... | ....... | ....... | ....... | ....... | ....... |
| *Chemical Prices* | | | | | | |
| Dept. of Labor: | | | | | | |
| Chem. price index† | .... | .... | 78.8 | 79.3 | 79.2 | 79.7 |
| Fert. price index† | .... | .... | 68.4 | 62.3 | 68.1 | 63.1 |
| Mixed Fert. price index† | .... | .... | 71.2 | 62.7 | 69.9 | 65.6 |
| *Chemical Employment* | | | | | | |
| Dept. of Labor: | | | | | | |
| Chem. emp.† | 122.9 | 86.8 | 122.9 | 85.4 | 121.3 | 84.6 |
| Fert. emp.† | 96.2 | 56.7 | 84.5 | 49.9 | 75.1 | 43.5 |
| Paints & varnish emp† | 83.4 | 64.2 | 80.2 | 63.6 | 77.0 | 65.7 |
| Petroleum & ref. emp† | 73.9 | 62.7 | 73.6 | 62.1 | 74.2 | 62.5 |
| Rayon emp† | 193.7 | 149.1 | 190.3 | 149.3 | 191.8 | 146.9 |
| Soap emp† | 112.5 | 95.1 | 105.2 | 94.2 | 106.9 | 94.5 |
| *Chemical payrolls* | | | | | | |
| Dept. of Labor: | | | | | | |
| Chemical† | 89.4 | 61.4 | 88.2 | 60.4 | 87.9 | 59.8 |
| Fertilizer† | 57.3 | 32.6 | 54.0 | 32.5 | 48.1 | 30.4 |
| Paint & varnish† | 64.3 | 47.3 | 61.8 | 45.9 | 59.4 | 49.3 |
| Petroleum refinery† | 60.7 | 53.0 | 59.9 | 53.3 | 59.8 | 51.8 |
| Rayon† | 173.7 | 121.0 | 164.4 | 123.5 | 174.5 | 122.5 |
| Soap† | 95.4 | 78.0 | 87.4 | 77.0 | 88.2 | 79.2 |

*37 states, F. W. Dodge Corp.; ‡000 omitted; *a* monthly average, 1923-25 = 100, Dept. of Commerce; †Dept. of Labor, 1926 = 100. *b* March '34 production steel ingots 2,797,194 against 909,886 in March, '33.

### Weekly Business Statistics

| Week Ending | Carloadings 1934 | Carloadings 1933 | % Inc. | Electrical Output 1934* | Electrical Output 1933* | % Inc. | Jour. Com. Price Index | National Fertilizer Association Indices: Metals | Fats & Oils | Chem. & Drugs | Mixed Fert. | Fert. Mat. | All Groups | Labor Dept. Chem. & Drug Price Index | % Steel Activity | Fisher's Index Purch. Power | N. Y. Times Index Bus. Act |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| March 3 | 604,137 | 481,208 | 25.5 | 1,658,040 | 1,422,875 | 16.5 | 74.9 | 78.6 | 55.2 | 93.1 | 75.8 | 67.6 | 71.6 | 75.4 | 47.7 | 134.5 | 82.3 |
| March 10 | 612,402 | 441,361 | 38.8 | 1,647,024 | 1,390,607 | 18.4 | 64.5 | 78.8 | 56.4 | 93.1 | 75.8 | 67.6 | 71.7 | 75.7 | 46.2 | 134.3 | 83.7 |
| March 17 | 625,773 | 453,637 | 38.0 | 1,650,013 | 1,375,207 | 20.0 | 75.0 | 78.8 | 52.1 | 93.7 | 75.9 | 67.7 | 71.3 | 75.8 | 46.8 | 134.0 | 85.3 |
| March 24 | 608,462 | 479,959 | 26.8 | 1,658,389 | 1,409,655 | 17.6 | 74.0 | 78.8 | 50.9 | 93.5 | 75.9 | 67.8 | 71.2 | 75.8 | 45.7 | 135.1 | 85.9 |
| March 31 | 608,443 | 498,356 | 22.1 | 1,665,650 | 1,402,142 | 18.8 | | 78.8 | 50.3 | 93.5 | 75.9 | 67.8 | 71.0 | 75.8 | 43.3† | | 84.9 |

*kwh., 000 omitted. †March steel ingot output was 47.81% of capacity.

# Prices Current

***Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.***

**Chemical prices quoted** are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

**Oils** are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

**Raw materials** are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

**The current range** is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

**Purchasing Power of the Dollar: 1926 Average—$1.00 - 1933 Average $1.56 - Jan. 1933 $1.76 - March 1934 $1.35**

| | Current Market | | 1934 Low | 1934 High | 1933 Low | 1933 High |
|---|---|---|---|---|---|---|
| Acetaldehyde, drs lc-1 wks...lb. | .... | .16 | .16 | .21 | .18½ | .21 |
| drums, c-l, wks.........lb. | .... | .14 | .14 | .16½ | ... | ... |
| Acetaldol, 50 gal dr..........lb. | .27 | .31 | .27 | .31 | .27 | .31 |
| Acetamide...................lb. | .40 | .75 | .40 | 1.35 | .95 | 1.35 |
| Acetanilid, tech, 150 lb bbl...lb. | .... | .26 | .... | .26 | ... | .26 |
| Acetic Anhydride, 92-95%, 100 lb cbys..............lb. | .21 | .25 | .21 | .25 | .21 | .25 |
| Acetin, tech drums..........lb. | .30 | .32 | .30 | .32 | .30 | .32 |
| Acetone, tanks..............lb. | .... | .10 | .... | .10 | .08 | .10 |
| Acetone Oil, bbls NY......gal.. | 1.15 | .25 | 1.15 | .25 | 1.15 | 1.25 |
| Acetyl Chloride, 100 lb cby...lb. | .55 | .68 | .55 | .68 | .55 | .68 |
| Acetylene Tetrachloride (see tetrachlorethane).............. | | | | | | |

## Acids

| | Current Market | | 1934 Low | 1934 High | 1933 Low | 1933 High |
|---|---|---|---|---|---|---|
| Acid Abietic.................. | .06¾ | .07 | .06 | .07 | .06 | .12 |
| Acetic, 28% 400 lb bbls c-1 wks ..........100 lb. | .... | 2.91 | .... | 2.91 | 2.65 | 2.91 |
| Glacial, bbl c-1 wk....100 lb. | .... | 10.02 | .... | 10.02 | 9.14 | 10.02 |
| Adipic...................... | .72 | .72 | .72 | .72 | .72 | .72 |
| Anthranilic, refd, bbls........lb. | .85 | .95 | .85 | .95 | .85 | .95 |
| Technical, bbls...........lb. | .65 | .70 | .65 | .70 | .65 | .70 |
| Battery, cbys...........100 lb. | 1.60 | 2.25 | 1.60 | 2.25 | 1.60 | 2.25 |
| Benzoic, tech, 100 lb bbls....lb. | .40 | .45 | .40 | .45 | .35 | .45 |
| Boric, powd, 250 lb. bbls. .......................lb. | .0425 | .05 | .0425 | .05 | .0425 | .05 |
| Broenner's, bbls.. ...........lb. | 1.20 | 1.25 | 1.20 | 1.25 | 1.20 | 1.25 |
| Butyric, 100% basis cbys....lb. | .80 | .85 | .80 | .85 | .80 | .85 |
| Camphoric.................lb. | .... | 5.25 | .... | 5.25 | ... | 5.25 |
| Chlorosulfonic, 1500 lb drums wks....................lb. | .04½ | .05½ | .04½ | .05½ | .04½ | .05½ |
| Chromic, 99¾%, drs..........lb. | .... | .13½ | .... | .13½ | .11½ | .14½ |
| Chromotropic, 300 lb bbls....lb. | 1.00 | 1.06 | 1.00 | 1.06 | 1.00 | 1.06 |
| Citric, USP, crystals, 230 lb. bbls..................lb. | .28 | .29 | .28 | .30 | .29 | .30 |
| Cleve's, 250 lb bbls.........lb. | .52 | .54 | .52 | .54 | .52 | .54 |
| Cresylic, 95%, dark drs NY.gal. | .... | .50 | .... | .50 | .38 | .50 |
| 97-99%, pale drs NY.....gal. | .... | .55 | .... | .55 | .40 | .55 |
| Formic, tech 90%, 140 lb. cby.....................lb. | .11 | .13 | .11 | .13 | .10½ | .13 |
| Furoic, tech., 100 lb. drums.lb. | .... | .35 | .... | .35 | ... | .35 |
| Gallic, tech, bbls............lb. | .60 | .70 | .60 | .70 | .60 | .70 |
| USP, bbls................lb. | .... | .77 | .74 | .77 | ... | .74 |
| Gamma, 225 lb bbls wks.....lb. | .77 | .79 | .77 | .79 | .75 | .79 |
| H, 225 lb bbls wks..........lb. | .65 | .70 | .65 | .70 | .60 | .70 |
| Hydriodic, USP, 10% soln cby lb. | .50 | .51 | .50 | .51 | .50 | .51 |
| Hydrobromic, 48%, coml, 155 lb cbys wks............lb. | .45 | .48 | .45 | .48 | .45 | .48 |
| Hydrochloric, CP, see Acid Muriatic.................. | | | | | | |
| Hydrocyanic, cylinders wks .lb. | .80 | .90 | .80 | .90 | .80 | .90 |
| Hydrofluoric, 30%, 400 lb bbls wks...................lb. | .... | .07 | .... | .07 | .06 | .07 |
| Hydrofluosilicic, 35%, 400 lb. bbls wks...............lb. | .11 | .12 | .11 | .12 | .11 | .12 |
| Hypophosphorous, 30%, USP, demijohns ..............lb. | .75 | .80 | .75 | .80 | .75 | .80 |
| Lactic, 22%, dark, 500 lb bbls lb. | .04 | .04½ | .04 | .04½ | .04 | .04½ |
| 44%, light, 500 lb bbls.....lb. | .11½ | .12 | .11½ | .12 | .11½ | .12 |
| Laurent's, 250 lb bbls.... ...lb. | .36 | .37 | .36 | .37 | .36 | .37 |
| Linoleic....................lb. | .16 | .16 | .16 | .16 | .16 | .16 |
| Maleic, cry. kegs............lb. | .... | .35 | .... | .35 | ... | ... |
| Malic, powd, kegs...........lb. | .45 | .60 | .45 | .60 | .45 | .60 |
| Metanilic, 250 lb bbls........lb | .60 | .65 | .60 | .65 | .60 | .65 |
| Mixed Sulfuric - Nitric......... | | | | | | |
| tanks wks..........N unit | .06½ | .07½ | .06½ | .07½ | .06½ | .07½ |
| tanks wks..........S unit | .008 | .01 | .008 | .01 | .008 | .01 |
| Monochloroacetic, tech bbl...lb. | .16 | .18 | .16 | .18 | .16 | .18 |
| Monosulfonic, bbls..........lb. | 1.50 | 1.60 | 1.50 | 1.60 | 1.50 | 1.60 |
| Muriatic, 18 deg, 120 lb cbys c-1 wks............100 lb. | .... | 1.35 | .... | 1.35 | ... | 1.35 |
| tanks, wks..........100 lb. | .... | 1.00 | .... | 1.00 | ... | 1.00 |
| 20 degrees, cbys wks...100 lb. | .... | 1.45 | .... | 1.45 | ... | 1.45 |
| N & W.............250 lb bbls | .85 | .95 | .85 | .95 | .85 | .95 |
| Naphthenic, drums .........lb. | .10 | .11½ | .10 | .11½ | .10 | .11½ |
| Naphthionic, tech......250 lb. | .60 | .65 | .60 | .65 | .60 | .65 |
| Nitric, 36 deg, 135 lb cbys c-wks. ...............100 lb. | .... | 5.00 | .... | 5.00 | ... | 5.00 |
| 40 deg, 135 lb cbys, c-1 wks.................100 lb. | .... | 6.00 | .... | 6.00 | ... | 6.00 |
| Oxalic, 300 lb bbls wks NY....lb. | .11⅞ | .12⅞ | .11⅞ | .12⅞ | .11 | .12⅞ |
| Phosphoric 50%, U. S. P.....lb. | .... | .14 | .... | .14 | ... | .14 |
| Syrupy, USP, 70 lb drs....lb. | .... | .14 | .... | .14 | ... | .14 |
| Picramic, 300 lb bbls........lb. | .65 | .70 | .65 | .70 | .65 | .70 |
| Picric, kegs.................lb. | .30 | .50 | .30 | .50 | .30 | .50 |
| Pyrogallic, crystals............ ........................lb. | 1.40 | 1.45 | 1.40 | 1.45 | 1.40 | 1.45 |
| Salicylic, tech, 125 lb bbl.....lb. | .33 | .37 | .33 | .37 | .33 | .37 |
| Sebacic, tech, drum..........lb. | .58 | .58 | .58 | .58 | .58 | .58 |
| Sulfanilic, 250 lb. bbls.......lb. | .18 | .19 | .18 | .19 | .15 | .17 |
| Sulfuric, 66 deg, 180 lb cbys | | | | | | |

†Anhydrous 5c higher. *Delivered metropolitan area, basic price 34c. §Higher price is refrigeration grade. a–New revenue tax adds $0.90 to the cost of tax paid ethyl alcohol. Quotation above includes this tax.

| | Current Market | | 1934 Low | 1934 High | 1933 Low | 1933 High |
|---|---|---|---|---|---|---|
| lc-1 wks...........100 lb. | 1.60 | 1.95 | 1.60 | 1.95 | 1.60 | 1.95 |
| tanks, wks, ton | .... | 15.00 | .... | 15.00 | .... | 15.00 |
| 1500 lb dr wks......100 lb. | 1.50 | 1.65 | 1.50 | 1.65 | 1.50 | 1.65 |
| 60°, 1500 lb dr wks....100 lb. | 1.27½ | 1.42½ | 1.27½ | 1.42½ | 1.27½ | 1.42½ |
| Oleum, 20%, 1500 lb. drs lc-1 wks...................ton | .... | 18.50 | .... | 18.50 | .... | 18.50 |
| 40%, lc-1 wks net........ton | .... | 42.00 | .... | 42.00 | .... | 42.00 |
| Tannic, tech, 300 lb bbls...lb. | .23 | .40 | .23 | .40 | .23 | .40 |
| Tartaric, USP, gran. powd, 300 lb bbls.............lb. | .... | .26 | .25 | .26 | .20 | .25 |
| Tobias, 250 lb bbls........lb. | .75 | .80 | .75 | .80 | .75 | .80 |
| Trichloroacetic bottles.....lb. | 2.00 | 2.75 | 2.00 | 2.75 | 2.00 | 2.75 |
| Kegs.................lb. | .... | 1.75 | ... | 1.75 | .... | 1.75 |
| Tungstic, bbls............lb. | 1.40 | 1.70 | 1.40 | 1.70 | 1.40 | 1.70 |
| Albumen, blood, 225 lb bbls...lb. | .45 | .53 | .35 | .53 | .35 | .43 |
| dark.............bbls., lb. | .12 | .17 | .10 | .17 | .10 | .17 |
| Egg, edible .............lb. | .83 | .92 | .85 | .92 | .74 | .90 |
| Technical, 200 lb cases...lb. | .62 | .66 | .62 | .66 | .62 | .66 |
| Vegetable, edible..........lb. | .65 | .70 | .65 | .70 | .60 | .70 |
| Technical.............lb. | .50 | .55 | .50 | .55 | .50 | .55 |
| Alcohol Butyl, Normal, 50 gal drs c-1 wks............lb. | .... | .10½ | .... | .10½ | .... | .10½ |
| Drums, 1-c-1 wks.......lb | .... | .11 | .... | .11 | .... | .11 |
| Tank cars wks...........lb. | .... | .09½ | .... | .09½ | .... | .09½ |
| Secondary tank .........lb. | .... | .076 | .... | .076 | .... | .... |
| drums carlots .........lb. | .... | .086 | .... | .086 | .... | .... |
| Amyl (from pentane) | | | | | | |
| Tanks wks ............lb. | .... | .143 | .... | .143 | .143 | .176 |
| Capryl, tech, drums.......lb. | .... | .85 | .... | .85 | .... | .85 |
| Diacetone, tanks..........lb. | .15¾ | .16¾ | .15¾ | .16¾ | .15¾ | .16¾ |
| Ethyl, USP, 190 pf, 50 gal. bbls..................gal. | 4.12½ | 4.24½a | 4.12½ | 4.24½ | 2.44½ | 2.65 |
| No. 5. *188 pf, 50 gal. drs. drums extra†........gal. | .... | .351* | .... | .351* | .... | *.385 |
| No. S. D. 1, tanks ......gal. | .... | .304 | .... | .304 | .... | .304 |
| Furfuryl, tech., 500 lb. drs.lb. | .... | .40 | .... | .40 | .40 | .45 |
| Isobutyl, ref., gal. drs.....gal. | .... | .75 | .... | .75 | .... | .75 |
| Isopropyl, ref, gal drs.....gal. | .... | .50 | .... | .50 | .45 | .50 |
| Propyl Normal, 50 gal dr..gal. | .... | .75 | .... | .75 | .... | .75 |
| Aldehyde Ammonia, 100 gal drlb. | .80 | .82 | .80 | .82 | .80 | .82 |
| Aldol. 95%, l-cl dr...........lb. | .... | .25 | .... | .25 | .... | .... |
| c-l, dr..................lb. | .... | .21 | .... | .21 | .... | .... |
| Alpha-Naphthol, crude, 300 lb. bbls....................lb. | .65 | .70 | .65 | .70 | .65 | .70 |
| Alpha-Naphthylamine, 350 lb. bbls....................lb. | .32 | .34 | .32 | .34 | .32 | .34 |
| Alum Ammonia, lump, 400 lb bbls, 1-c-1 wks......100 lb. | 3.00 | 3.25 | 3.00 | 3.25 | 3.00 | 3.25 |
| Chrome, 500 lb casks, wks ...................100 lb. | 7.00 | 7.25 | 6.50 | 7.25 | 4.50 | 6.50 |
| Potash, lump, 400 lb casks wks...............100 lb. | 3.00 | 3.50 | 3.00 | 3.50 | 3.00 | 3.50 |
| Soda, ground, 400 lb bbls wks ...............100 lb. | 3.50 | 3.75 | 3.50 | 3.75 | 3.50 | 3.75 |
| Aluminum Metal, c-1 NY.100 lb. | 22.90 | 24.30 | 22.90 | 24.30 | 22.00 | 24.30 |
| Chloride Anhyd., 99%, wks.lb. | .07 | .12 | .07 | .12 | .... | .... |
| 93% grade, wks.........lb. | .04 | .08 | .04 | .08 | .... | .... |
| Hydrate, 96%, light, 90 lb. bbls..................lb. | .13 | .15 | .13 | .16½ | .15 | .16½ |
| Palmitate, bbls.,...........lb. | .19 | .20 | .19 | .20 | .... | .... |
| Resinate, pp., bbls........lb. | .12½ | .14 | .12½ | .14 | .... | .... |
| Stearate, 100 lb bbls.......lb. | .17 | .18 | .17 | .18 | .12½ | .18 |
| Sulfate, Iron, free, bags c-1 wks ..............100 lb. | 1.90 | 1.95 | 1.90 | 1.95 | 1.90 | 1.95 |
| Coml, bags c-1 wks .100 lb. | 1.35 | 1.50 | 1.35 | 1.50 | 1.25 | 1.50 |
| Aminoazobenzene, 110 lb kegs lb. | .... | 1.15 | .... | 1.15 | .... | 1.15 |

## Ammonia

| | Current Market | | 1934 Low | 1934 High | 1933 Low | 1933 High |
|---|---|---|---|---|---|---|
| Ammonia anhydrous Com. tanks | .04½ | .05½§ | .04½ | .05½§ | .04½ | .05½ |
| Ammonia, anhyd. 100 lb cyl...lb. | .15¼ | .15½ | .15¼ | .15½ | .15¼ | .15½ |
| Water, 26°, 800 lb dr del...lb. | .02½ | .03 | .02½ | .03 | .02½ | .03 |
| Ammonia, aqua 26° tanks.... NH cont................ | .... | .05 | .... | .05 | ..... | .05 |
| Ammonium Acetate ........lb. | .26 | .33 | .26 | .33 | .26 | .33 |
| Bicarbonate, bbls., f.o.b. plant ..................100 lb. | .... | 5.15 | .... | 5.15 | .... | 5.15 |
| Bifluoride, 300 lb bbls.....lb. | .15¼ | .17 | .15¼ | .17 | .15¼ | .17 |
| Carbonate, tech, 500 lb cs..lb. | .08 | .12 | .08 | .12 | .08 | .12 |
| Chloride, white, 100 lb. bbls wks .............100 lb. | 5.00 | 5.25 | 5.00 | 5.25 | 4.45 | 5.25 |
| Gray, 250 lb bbls wks...lb. | 5.25 | 5.75 | 5.25 | 5.75 | 5.25 | 5.75 |
| Lump, 500 lb cks spot...lb. | .10 | .11 | 10 | 11 | .10 | .11 |
| Lactate, 500 lb bbls.......lb. | .15 | .16 | .15 | .16 | .15 | .16 |
| Linoleate.................lb. | .... | .12 | .11 | .12 | .... | .11 |
| Nitrate, tech, casks........lb. | .03¾ | .05 | .03¾ | .05 | .03¾ | .10 |
| Oleate, drs...............lb. | .... | .10 | .... | .10 | .... | .10 |
| Persulfate, 112 lb kegs.....lb. | .20 | .22½ | .20 | .22½ | .20 | .22½ |
| Phosphate, tech, powd, 325 lb. bbls..................lb. | .08 | .10 | .08 | .11½ | .08½ | .11½ |
| Sulfate, bulk c-1.......100 lb. | .... | 1.25 | .... | 1.25 | 1.00 | 1.25 |
| Sulfocyanide, kegs........lb. | .... | .50 | .... | .50 | .36 | .50 |
| Amyl Acetate, (from pentane) | | | | | | |
| Tanks del..............lb | .... | .13½ | .... | .13½ | ... | 13½ |
| Tech., drs del............lb. | .142 | .149 | .142 | .149 | .138 | .149 |

| | Current Market | | 1934 Low | 1934 High | 1933 Low | 1933 High |
|---|---|---|---|---|---|---|
| Secondary, tanks..........lb. | .... | .09 | .... | .09 | .... | .09 |
| Amyl Alcohol, see also Fusel Oil. | | | | | | |
| Amyl Alcohol, sec..........lb. | .... | .08½ | .08½ | .08½ | .... | .... |
| Aniline Oil, 960 lb drs & tks..lb. | .15 | .17½ | .15 | .17½ | .14½ | .16 |
| Annatto, fine..............lb. | .34 | .37 | .34 | .37 | .34 | .37 |
| Anthracene, 80%............lb. | .... | .75 | .... | .75 | .... | .... |
| 40%.......................lb. | .... | .18 | .... | .18 | .... | .... |
| Anthraquinone, sublimed, 125 lb. bbls..........lb. | .... | .45 | .... | .45 | ... | .45 |
| Antimony, metal slabs, ton lots lb. | .... | .076 | .07 | .076 | .05⅝ | .07½ |
| Needle, powd, bbls........lb. | .08 | .09 | .08 | .09 | .07 | .09 |
| Chloride, soln (butter of) cbys..........lb. | .13 | .17 | .13 | .17 | .13 | .17 |
| Oxide, 500 lb bbls.........lb. | .08 | .11 | .08 | .11 | .07½ | .11 |
| Salt, 63% to 65%, tins....lb. | .22 | .24 | .22 | .24 | .20 | .24 |
| Sulfuret, golden, bbls .....lb. | .16 | .20 | .16 | .20 | .16 | .20 |
| Vermillion, bbls...........lb. | .38 | .42 | .38 | .42 | .38 | .42 |
| Archil, conc, 600 lb bbls.....lb. | .21 | .27 | .21 | .27 | .20 | .21 |
| Double, 600 lb bbls........lb. | .18 | .20 | .18 | .20 | .16 | .17 |
| Triple, 600 lb bbls.... ....lb. | .18 | .20 | .18 | .20 | .16 | .17 |
| Argols, 80%, casks..........lb. | .15 | .16 | .15 | .16 | .12 | .15 |
| Crude, 30%, casks........lb. | .08 | .09 | .08 | .09 | .06¾ | .09 |
| Aroclors, wks..............lb. | .18 | .30 | .18 | .30 | .18 | .30 |
| Arrowroot, bbl..............lb. | .08¾ | .09¼ | .08¾ | .09¼ | .... | .... |
| Arsenic, Red. 224 lb kegs, cs..lb. | .15 | .15½ | .14 | .15½ | .09⅜ | .14¾ |
| White, 112 lb kegs.........lb. | .04 | .05 | .04 | .05 | .04 | .05 |
| Metal...................lb. | .40 | .42 | .40 | .45 | .... | .... |
| Asbestine, c-1 wks..........ton | 13.00 | 15.00 | 13.00 | 15.00 | 13.00 | 15.00 |
| **Barium** | | | | | | |
| Barium Carbonate, precip, 200 lb. bags wks............ton | 56.50 | 61.00 | 56.50 | 61.00 | 56.50 | 61.00 |
| Nat. (witherite) 90% gr. carlots wks bags............ton | .... | 45.00 | ..... | 45.00 | ..... | ..... |
| Chlorate, 112 lb kegs NY..lb. | .15 | .16 | .15 | .16 | .13¾ | .16 |
| Chloride, 600 lb bbl wks...ton | 72.00 | 74.00 | 72.00 | 74.00 | 61.50 | 74.00 |
| Dioxide, 88%, 690 lb drs...lb. | .11 | .13 | .11 | .13 | .11 | .13 |
| Hydrate, 500 lb bbls.......lb. | .04¾ | .05 | .04¾ | .05 | .04½ | .05 |
| Nitrate, 700 lb casks......lb. | .... | .08¼ | ..... | .08¼ | ... | .07½ |
| Barytes, Floated, 350 lb bbls wks...............ton | 23.00 | 30.50 | 23.00 | 30.50 | 22.20 | 30.50 |
| Bauxite, bulk, mines........ton | 5.00 | 6.00 | 5.00 | 6.00 | 5.00 | 6.00 |
| Bayberry, bags..............lb. | .25 | .30 | .25 | .30 | .14½ | .17 |
| Beeswax, Yellow, crude bags..lb. | .21 | .22 | .16 | .22 | .13 | .20 |
| Refined, cases...........lb. | .26 | .29 | .21 | 29 | .18 | .26 |
| White, cases..............lb. | .34 | .37 | .32 | .37 | .30 | .35 |
| Benzaldehyde, technical, 945 lb. drums wks............lb. | .60 | .65 | .60 | .65 | .60 | .65 |
| Benzene, 90%, Industrial, 8000 gal tanks wks.........gal. | .... | .20½ | ..... | .20½ | .20 | .22 |
| Ind. Pure, tanks works....gal. | .... | .20½ | ..... | .20½ | .20 | .22 |
| Benzidine Base, dry, 250 lb. bbls..................lb. | .67 | .69 | .67 | .69 | .65 | .67 |
| Benzoyl, Chloride, 500 lb drs.lb. | .40 | .45 | .40 | .45 | .40 | .45 |
| Benzyl Chloride, tech drs....lb. | .... | .30 | ..... | 30 | ... | .30 |
| Beta-Naphthol, 250 lb bbl wk.lb. | .... | .24 | ..... | .24 | ... | .24 |
| Naphthylamine, sublimed, 200 lb bbls. ..............lb. | 1.25 | 1.35 | 1.25 | 1.35 | 1.25 | 1.35 |
| Tech, 200 lb bbls .........lb. | .53 | .58 | .53 | .58 | .53 | .58 |
| Bismuth, metal.............. | .... | 1.30 | .... | 1.30 | .85 | 1.30 |
| Bismuth Subnitrate ........... | .... | 1.40 | .... | 1.40 | .95 | 1.40 |
| Blackstrap, cane, (see Molasses, Blackstrap) | | | | | | |
| Blanc Fixe, 400 lb bbls wks..ton | 42.50‡ | 70.00 | 42.50‡ | 70.00 | 42.50 | 75.00 |
| Bleaching Powder, 800 lb drs c-1 wks contract....100 lb. | .... | 1.90 | ..... | 1.90 | 1.75 | 1.90 |
| Blood, Dried, fob, NY.....Unit | .... | 3 25 | 2.60 | 3.25 | 1.55 | 2.75 |
| Chicago, high grade.....Unit | .... | 3.00 | 2.25 | 3.10 | .... | .... |
| S. American shipt.......Unit | .... | 3.15 | 2.90 | 3.15 | 1.90 | 3.00 |
| Blues, Bronze Chinese Milori Prussian Soluble........lb. | .35½ | .37½ | .35½ | .37½ | ... | .35 |
| Bone, raw, Chicago.........ton | 20.00 | 22.00 | 20.00 | 25.00 | 19.00 | 28.00 |
| Bone Ash, 100 lb kegs.......lb. | .06 | .07 | .06 | .07 | .06 | .07 |
| Black, 200 lb bbls.........lb. | .05½ | .08¼ | .05½ | .08¼ | .05½ | .08 |
| Meal, 3% & 50%, Imp....ton | 18.00 | 19.00 | 16.00 | 20.00 | 18.00 | 27.50 |
| Borax, bags................lb. | .018 | .02 | .018 | .02 | .018 | .02 |
| Bordeaux, Mixture, 16% pwd.lb. | .10½ | .14 | .10½ | .14 | .11½ | .13 |
| Paste, bbls...............lb. | .10½ | .14 | .10½ | .14 | .10½ | .13 |
| Brazilwood, sticks, shpmt.....lb. | 26.00 | 28.00 | 26.00 | 28.00 | 26.00 | 28.00 |
| Bromine, cases..............lb. | .36 | .43 | .36 | .43 | .36 | .43 |
| Bronze, Aluminum, powd blk..lb. | .50 | .75 | .50 | .75 | .50 | .75 |
| Gold bulk...............lb. | .40 | .55 | .40 | .55 | .40 | .55 |
| Butanes, com 16.32° group 3 tanks..................lb. | .02¾ | .04 | .02¾ | .04 | .02¾ | .04 |
| Butyl, Acetate, normal drs...lb. | .... | .11 | ..... | .11 | .11 | .139 |
| Tank, wks.. ..........lb. | .... | .10 | ..... | .10 | .10 | .124 |
| Secondary tanks, wks......lb. | .... | .08 | .... | .08 | .... | .... |
| Aldehyde, 50 gal drs wks...lb. | .35 | .36 | .35 | .36 | .31½ | .36 |
| Carbitol see Diethylene Glycol Mono (Butyl Ether) ..... | .... | ..... | ..... | ..... | .... | .... |
| Cellosolve (see Ethylene glycol mono butyl ether)......... | | | | | | |
| Furoate. tech.. 50 gal. dr...lb. | .... | .60 | ..... | .60 | .50 | .60 |
| Lactate, drums ..........lb. | .... | .29 | .... | .29 | .... | .... |
| Propionate, drs...........lb. | .20 | .22 | .20 | .22 | .20 | .22 |
| Stearate, 50 gal drs.. .....lb. | .25 | .25½ | .25 | .25½ | .25 | .25 |
| Tartrate, drs.............lb. | .55 | .60 | .55 | .60 | .55 | .60 |
| Cadmium, Sulfide, boxes.....lb. | .65 | .75 | .65 | .75 | .65 | .75 |
| Calcium, Acetate, 150 lb bags c-1................100 lb. | .... | 3.00 | ..... | 3.00 | 2.50 | 3.00 |
| Arsenate, 100 lb bbls c-1 wks..................lb. | .... | .05¾ | .05¾ | .07 | .05½ | .07 |
| Carbide, drs..............lb. | .05 | .06 | .05 | .06 | .05 | .06 |
| Carbonate, tech, 100 lb bags c-1..................lb. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Chloride, Flake, 375 lb drs c-1 wks..............ton | .... | 19.50 | ..... | 19.50 | 19 50 | 21.00 |
| Solid, 650 lb drs c-1 fob wks ......................ton | .... | 17.50 | ..... | 17.50 | 17.50 | 18.00 |
| Ferrocyanide, 350 lb. bbls. f.o.b. wks..........lb. | .... | .17 | ..... | .17 | .17 | .17 |

†F. O. B. destination, 1931 prices are works prices.
‡Lowest price is for pulp; highest for high-grade precipitate.

| | Current Market | | 1934 Low | 1934 High | 1933 Low | 1933 High |
|---|---|---|---|---|---|---|
| Calcium Furoate, tech, 100 lb. drums....lb. | .... | .30 | ..... | .30 | .... | .30 |
| Nitrate, 100 lb bags.......ton | .... | 26.50 | ..... | 26.50 | 24.00 | 26.50 |
| Palmitate, bbls.........lb. | .19 | .20 | .19 | .20 | .16 | .19 |
| Peroxide, 100 lb drs.......lb. | .... | 1.25 | ..... | 1.25 | .... | 1.25 |
| Phosphate, tech, 450 lb bbls.lb. | .07½ | .08 | .07½ | .08 | .07½ | .08 |
| Resinate, precip., bbls.....lb. | .13 | .14 | .13 | .14 | .... | .... |
| Stearate, 100 lb. bbls......lb. | .17 | .18 | .17 | .18 | .12½ | .18 |
| Camphor, slabs..............lb. | .54 | .56 | .54 | .59 | .35½ | .59 |
| Powder.................lb. | .54 | .56 | .54 | .59 | .38 | .59 |
| Camwood, Bark, ground bbls.lb. | .16 | .18 | .16 | .18 | .16 | .18 |
| Candelilla Wax, bags........lb. | .14 | .14½ | .10¼ | .14½ | .09 | .11 |
| Carbitol, (See Diethylene Glycol Mono Ethyl Ether)........ | .... | .... | ..... | ..... | .... | ... |
| Carbon, Decolorizing, drums c-1....lb. | .08 | .15 | .08 | .15 | .08 | .15 |
| Black, 100-300 lb cases 1c-1 NY....lb. | .07 | .08¼ | .06½ | .08¼ | .06 | .12 |
| Bisulfide, 500 lb drs 1c-1 NY....lb. | .05½ | .06 | .05½ | .06 | .05½ | .06 |
| Dioxide, Liq. 20-25 lb cyl..lb. | .... | .06 | .. .. | .06 | .... | .06 |
| Tetrachloride, 1400 lb drs delivered. ........lb. | .05¼ | .06 | .05¼ | .06 | .05¼ | .07 |
| Carnauba Wax, Flor, bags...lb. | .37 | .38 | .32 | .38 | .23 | .33 |
| No. 1 Yellow, bags .......lb. | .35 | .36 | .30 | .36 | .20 | .35 |
| No. 2 N Country, bags....lb. | Nominal | | .20 | .23 | .14 | .20 |
| No. 3 N. C..............lb. | .20 | .21½ | .16¼ | .21½ | .11½ | .17 |
| No. 3 Chalky ............lb. | .20 | 21½ | .16 | .21½ | .12 | .17 |
| Casein, Standard, Domestic.... ground..............lb | .12½ | .13 | .11½ | .13 | .06½ | .15 |
| 80-100 mesh carlots, bags..lb. | .13½ | .14 | .13 | .14 | .... | .... |
| Cellosolve (see Ethylene glycol mono ethyl ether)......... | | | | | | |
| Acetate (see Ethylene glycol mono ethyl ether acetate).. | | | | | | |
| Celluloid, Scraps, Ivory cs....lb. | .13 | .14 | .13 | .14 | .13 | .15 |
| Shell, cases..............lb. | .18 | .20 | .18 | .20 | .18 | .20 |
| Transparent, cases........lb. | .... | .16 | ..... | .16 | .... | .16 |
| Cellulose, Acetate, 50 lb kegs.lb. | .80 | .90 | .80 | .90 | .80 | .90 |
| Chalk, dropped, 175 lb bbls..lb. | .03 | .03¾ | .03 | .03¾ | .03 | .03¾ |
| Precip, heavy, 560 lb cks...lb. | .03 | .04 | .03 | .04 | .02 | .03½ |
| Light, 250 lb casks........lb. | .03 | .04 | .03 | .04 | .02½ | .03½ |
| Charcoal, Hardwood, lump, bulk wks..........bu. | .18 | .19 | .18 | .19 | .18 | .19 |
| Willow, powd, 100 lb bbl. wks..........lb. | .06 | .06¼ | .06 | .06¼ | .06 | .06¼ |
| Wood, powd, 100 lb bbls...lb. | .04 | .05 | .04 | .05 | .04 | .05 |
| Chestnut, clarified bbls wks...lb. | .01⅝ | .01¾ | .01⅝ | .01¾ | .01¼ | .02 |
| 25% tks wks.............lb. | .01¼ | .01½ | .01¼ | .01½ | .012 | .01½ |
| Powd, 60%, 100 lb bgs wks.lb. | .... | .04⅞ | ..... | .04⅞ | .... | .04¾ |
| Powd, decolorized bgs wks..lb. | .05 | .05¼ | .05 | .05¼ | .04⅞ | .05 |
| China Clay, lump, blk mines..ton | 8.00 | 9.00 | 8.00 | 9.00 | 8.00 | 9.00 |
| Powdered, bbls............lb. | .01 | .02 | .01 | .02 | .01 | .02 |
| Pulverized, bbls wks......ton | 10.00 | 12.00 | 10.00 | 12.00 | 10.00 | 12.00 |
| Imported, lump, bulk.....ton | 15.00 | 25.00 | 15.00 | 25.00 | 15.00 | 25.00 |
| Chlorine, cyls 1c-1 wks contract ....................lb. | .07 | .08½ | .07 | .08½ | .07 | .08½ |
| cyls, cl., contract........lb. | .... | .05½† | ..... | .05½† | .... | .05½ |
| Liq tank or multi-car lot cyls wks contract........100 lb. | .... | 1.85 | ..... | 1.85 | 1.75 | 1.85 |
| Chlorobenzene, Mono, 100 lb. drs 1c-1 wks..........lb. | .06 | .07½ | .06 | .07½ | .06 | .07½ |
| Chloroform, tech, 1000 lb drs..lb. | .... | .20 | ..... | .20 | .15 | .20 |
| USP, tins..............lb. | .... | .30 | ..... | .30 | .... | .... |
| Chloropicrin, comml cyls.....lb. | .90 | 1.25 | .90 | 1.25 | .90 | 1.35 |
| Chrome, Green, CP.........lb. | .28 | .29 | .28 | .29 | .28 | .29 |
| Commercial..............lb. | .06½ | .10 | .06½ | .10 | .06½ | .10 |
| Yellow..................lb. | .15 | .16 | .15 | .16 | .14 | .16 |
| Chromium, Acetate, 8% Chrome bbls..............lb. | .05 | .05¾ | .05 | .05¾ | .04¾ | .05¾ |
| 20° soln, 400 lb bbls......lb. | .... | .05½ | ..... | .05½ | .... | .05½ |
| Fluoride, powd, 400 lb bbl..lb. | .27 | .28 | .27 | .28 | .27 | .28 |
| Oxide, green, bbls.........lb. | .22 | .23 | .22 | .23 | .19 | .23 |
| Coal tar, bbls..............bbl. | 8.50 | 9.00 | 8.50 | 9.00 | .50 | 9.00 |
| Cobalt Acetate, bbls........lb. | .75 | .80 | .75 | .80 | .... | .... |
| Carbonate tech., bbls......lb. | 1.34 | 1.40 | 1.34 | 1.40 | .... | .... |
| Hydrate, bbls............lb. | 1.66 | 1.76 | 1.66 | 1.76 | .... | .... |
| Linoleate, paste, bbls......lb. | .39 | .40 | .39 | .40 | .... | .... |
| Resinate, fused, bbls.......lb. | .... | .12½ | ..... | .12½ | .... | .... |
| Precipitated, bbls.......lb. | .41 | .42 | .41 | .42 | .41 | .42 |
| Cobalt Oxide. black. bags....lb. | 1.25 | 1.35 | 1.25 | 1.35 | 1.15 | 1.35 |
| Cochineal, gray or black bag..lb. | .36 | .42 | .36 | .42 | .36 | .42 |
| Teneriffe silver, bags......lb. | .37 | .43 | .37 | .43 | .37 | .43 |
| Copper, metal, electrol...100 lb. | .... | 8.00 | 7.87½ | 8.25 | 5.00 | 9.00 |
| Carbonate, 400 lb bbls.....lb. | .... | .08¼ | ..... | .08¼ | .07 | .08 |
| 52-54% bbls............lb. | .... | .16¼ | ..... | .16¼ | .15¾ | .17¼ |
| Chloride, 250 lb bbls......lb. | .17 | .18 | .17 | .18 | .17 | .18 |
| Cyanide, 100 lb drs........lb. | .39 | .40 | .39 | .40 | .39 | .40 |
| Oleate, precip., bbls.......lb. | .... | .20 | ..... | .20 | .... | .... |
| Oxide, red, 100 lb bbls.....lb. | .12½ | .17 | .12½ | .17 | .14¾ | .15 |
| Resinate, precip., bbls.....lb. | .18 | .19 | .18 | .19 | .... | .... |
| Stearate, precip., bbls.....lb. | .35 | .40 | .35 | .40 | .... | .... |
| Sub-acetate verdigris, 400 lb bbls..............lb. | .18 | .19 | .18 | .19 | .18 | 19 |
| Sulfate, bbls c-1 wks....100 lb. | .... | 3.75 | ..... | 3.75 | 3.00 | 3.75 |
| Copperas, crys and sugar bulk c-1 wks bags..........ton | 14.00 | 14.50 | 14.00 | 14.50 | 14.00 | 14.50 |
| Corn Syrup, 42 deg., bbls.100 lb. | .... | 3.04 | ..... | 3.04 | 2.61 | 3.04 |
| 43 deg., bbls...........100 lb. | .... | 3.09 | ..... | 3.09 | 2.66 | 3.09 |
| Cotton, Soluble, wet, 100 lb bbls..............lb. | .40 | .42 | .40 | .42 | .40 | .42 |
| Cottonseed, S. E. bulk c-1...ton | | (*See Oils and Fats News Section*) | | | | |
| 7% Amm., bags mills...ton | 13.25 | 38.00 | 13.25 | 38.00 | 13.25 | 38.00 |
| Cream Tartar, USP, 300 lb. bbls..............lb. | .18¾ | .19 | .17½ | .19 | .14½ | .17¾ |
| Creosote, USP, 42 lb cbys.....lb. | .45 | .47 | .45 | .47 | .40 | .47 |
| Oil, Grade 1 tanks........gal. | .11 | .12 | .11 | .12 | .11 | .12 |
| Grade 2...............gal. | .10 | .12 | .10 | .12 | .10 | .12 |
| Grade 3...............gal. | .09 | .12 | .09 | .12 | .09 | .12 |
| Cresol, USP. drums.........lb. | .... | .11 | ..... | .11 | .10½ | .11 |
| Crotonaldehyde, 98% 50 gal dr.lb.* | .26 | .30 | .26 | .30 | .32 | .36 |

†Delivered. *Lower price is for carlots.

| | Current Market | | 1934 | | 1933 | |
|---|---|---|---|---|---|---|
| | | | Low | High | Low | High |
| Cudbear, English............lb. | .19 | .25 | .19 | .25 | .16 | .25 |
| Cutch, Rangoon, 100 lb bales.lb. | .... | .02¾ | ..... | .02¾ | .02½ | .03 |
| Borneo, Solid, 100 lb bale...lb. | .... | .04½ | ..... | .04½ | .02½ | .04½ |
| Philippine, 100 lb. bale....lb. | .03½ | .04½ | .03½ | 04½ | .... | .... |
| Cyanamide, bags c-1 frt allowed Ammonia unit............ | .... | 1.07½ | ..... | 1.07½ | .97½ | 1.07½ |
| Dextrin, corn, 140 lb bags.100 lb. | 3.62 | 3.82 | 3.62 | 3.82 | 2.89 | 3.84 |
| British Gum, bags .....100 lb. | 3.87 | 4.07 | 3.87 | 4.07 | 3.89 | 3.92 |
| White, 140 lb bags.....100 lb | 3.47 | 3.67 | 3.47 | 3.67 | 2.94 | 3.79 |
| Potato Yellow, 220 lb bgs..lb. | .07¾ | .08¾ | .07¾ | .08¾ | .07¾ | .09 |
| White, 220 lb bags lc-l....lb. | .08 | .09 | .08 | .09 | .08 | .09 |
| Tapioca, 200 lb bags lc-l...lb. | .06¾ | .07¾ | .06¾ | .07¾ | .06¾ | .08 |
| Diamylether, wks., drums....lb. | .60 | .77 | .60 | .77 | .... | .... |
| Diamylphthalate, drs wks...gal. | .... | .20½ | ..... | .20½ | .... | .... |
| Dianisidine, barrels..........lb. | 2.35 | 2.45 | 2.35 | 2.45 | 2.35 | 2.70 |
| Dibutylphthalate, wks.......lb. | .20½ | .21 | .20½ | .21 | .20½ | .22 |
| Dibutyltartrate, 50 gal drs...lb. | .29½ | .31½ | .29½ | .31½ | .29½ | .21 |
| Dichlorethylene, drums.....gal. | .29 | .... | .29 | .... | .... | .... |
| Dichloroethylether, 50 gal drs lb. | .... | .21 | ..... | .21 | .16 | .21 |
| Dichloromethane, drs wks....lb. | .... | .15 | .... | .15 | .... | .... |
| Diethylamine, 400 lb drs.....lb. | 2.75 | 3.00 | 2.75 | 3.00 | 2.75 | 3.00 |
| Diethylcarbonate, com. drs...lb. | .... | .35 | ..... | .35 | .... | .... |
| 90% grade, drs..........lb. | .... | .25 | ..... | .25 | .... | .... |
| Diethylaniline, 850 lb drs....lb. | .52 | .55 | .52 | .55 | .52 | .55 |
| Diethyleneglycol, drs........lb. | .14 | .16 | .14 | .16 | .14 | .16 |
| Mono ethyl ether, drs...lb. | .15 | .16 | .15 | .16 | .15 | .16 |
| Mono butyl ether, drs...lb. | .... | .26 | ..... | .26 | .... | .26 |
| Diethylene oxide, 50 gal drs..lb. | .26 | .27 | .26 | .27 | .26 | .27 |
| Diethylorthotoluidin, drs.....lb. | .64 | .67 | .64 | .67 | .64 | .67 |
| Diethyl phthalate, 1000 lb. drums..................lb. | .26 | .27 | .26 | .27 | .20 | .26 |
| Diethylsulfate, technical, 50 gal drums..................lb. | .... | .... | ... | ... | .... | .... |
| Digtycol Oleate, bbls.........lb. | .... | .16 | ..... | .16 | .... | .... |
| Dimethylamine, 400 lb drs, pure 25 & 40% sol. 100% basis.lb. | .... | 1.20 | ..... | 1.20 | .... | .... |
| Dimethylaniline, 340 lb drs...lb. | .29 | .30 | .29 | .30 | .25 | .28 |
| Dimethyl phthalate drs.........lb. | .... | .24½ | ..... | .24½ | .... | .... |
| Dimethylsulfate, 100 lb drs...lb. | .45 | .50 | .45 | .50 | .45 | .50 |
| Dinitrobenzene, 400 lb bbls...lb. | .17 | .19½z | .17 | .19½z | .... | .18 |
| Dintrochlorobenzene, 400 lb bbls..................lb. | .14½ | .15½ | .14½ | .15½ | .13 | .15 |
| Dinitronaphthalene, 350 lb bbls ......................lb. | .34 | .37 | .34 | .37 | .34 | .37 |
| Dinitrophenol, 350 lb bbls.....lb. | .23 | .24 | .23 | .24 | .23 | .24 |
| Dinitrotoluene, 300 lb bbls....lb. | .15½ | .16½ | .15½ | .16½ | .15 | .17 |
| Dioxan (See Diethylene Oxide).. | .... | .... | ..... | ..... | .... | .... |
| Diphenyl......................lb. | .15 | .25 | .15 | .25 | .15 | .40 |
| Diphenylamine................lb. | .31 | .34 | .31 | .34 | .31 | .34 |
| Diphenylguanidine, 100 lb bbl lb. | .36 | .37 | 36 | .37 | .30 | .37 |
| Dip Oil, 25%, drums.........lb. | .23 | .25 | .23 | .25 | .23 | .25 |
| Divi Divi pods, bgs shipmt..ton | .... | 36.00 | ..... | 36.00 | 26.00 | 36.00 |
| Extract.....................lb. | .05 | .05½ | .05 | .05½ | .05 | .05½ |
| Egg Yolk, 200 lb cases ......lb. | .44 | .45 | .40 | .45 | .40 | .43 |
| Epsom Salt, tech, 300 lb bbls c-1 NY ..........100 lb. | .... | 2.20 | ..... | 2.20 | .... | 2.20 |
| Ether, USP anaesthesia 55 lb. drs. .....................lb. | .... | .24 | ..... | .24 | .22 | .24 |
| (Conc)....................lb. | .09 | .10 | .09 | .10 | .09 | .10 |
| Isopropyl 50 gal. drums ...lb. | .07‡x | .08 | .07‡x | .08 | .07 | .08 |
| Synthetic, wks, drums.....lb. | .08 | .09 | .08 | .09 | .... | .... |
| Ethyl Acetate, 85% Ester | | | | | | |
| tanks..................lb. | .07½ | .08 | .07½ | .08 | .07½ | .09 |
| drums..................lb. | .08½ | .09 | .08½ | .09 | .08½ | .10 |
| Anhydrous, tanks.........lb. | .09 | .10 | .09 | .10 | .09 | .10 |
| drums..................lb. | .10 | .10¼ | .10 | .10¼ | .10 | .10¼ |
| Acetoacetate, 50 gal drs....lb. | .65 | .68 | .65 | .68 | .65 | .68 |
| Benzylaniline, 300 lb drs...lb. | .88 | .90 | .88 | .90 | .88 | .90 |
| Bromide, tech, drums......lb. | .50 | .55 | .50 | .55 | .50 | .55 |
| Chloride, 200 lb drums.....lb. | .... | .24 | ..... | .24 | .22 | .24 |
| Chlorocarbonate cbys.....lb. | .... | .30 | ..... | .30 | .... | .30 |
| Crotonate, drums..........lb. | 1.00 | 1.25 | 1.00 | 1.25 | .... | .... |
| Ether, Absolute, 50 gal drs.lb. | .50 | .52 | .50 | .52 | .50 | .52 |
| Furoate, 1 lb tins.........lb. | .... | 1.00 | ..... | 1.00 | 1.00 | 5.00 |
| Lactate, drums works. .. .lb. | .25 | .29 | .25 | .29 | .25 | .29 |
| Methyl Ketone, 50 gal drs..lb. | .... | .12½ | ..... | .12½ | .... | .12½ |
| Oxalate, drums works......lb. | .37½ | .55 | .37½ | .55 | .37½ | .55 |
| Oxybutyrate, 50 gal drs wks lb. | .30 | .30½ | .30 | .30½ | .30 | .30½ |
| Ethylene Dibromide, 60 lb dr..lb. | .65 | .70 | .65 | .70 | .65 | .70 |
| Chlorhydrin, 40%, 10 gal cbys. chloro, cont.............lb. | .75 | .85 | 75 | .85 | .75 | .85 |
| Dichloride, 50 gal drums....lb. | .05½ | .06½ | .05½ | .06½ | .05 | .09 |
| Glycol, 50 gal drs wks.....lb. | .26 | .28 | .26 | .28 | .25 | .28 |
| Mono Butyl Ether drs wks. | .... | .20 | ..... | .20 | .... | .20 |
| Mono Ethyl Ether drs wks | .15 | .17 | .15 | .17 | .15 | .17 |
| Mono Ethyl Ether Acetate dr. wks.................. | .16½ | .18 | .16½ | .18 | .16½ | .18 |
| Mono Methyl Ether, drs..lb. | .21 | .23 | .21 | .23 | .21 | .23 |
| Stearate.................. | .18 | .18 | .18 | .18 | .18 | .18 |
| Oxide, cyl................lb. | .... | .75 | ..... | .75 | .... | .75 |
| Ethylidenaniline............lb. | .45 | .47½ | .45 | .47½ | .45 | .47½ |
| Feldspar, bulk pottery .....ton | .... | 14.50 | ..... | 14.50 | 14.00 | 16.50 |
| Powdered, bulk works....ton | 13.50 | 14.50 | 13.50 | 14.50 | 13.50 | 14.50 |
| Ferric Chloride, tech, crystal 475 lb bbls.............lb. | .05 | .07½ | .05 | .07½ | .04½ | .07½ |
| Fish Scrap, dried, wks.......unit | .... | Nom. | ..... | 2.50* | 1.85 | 2.75* |
| Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis...unit | .... | Nom. | ..... | 2.50† | 1.85 | 2.50† |
| Fluorspar, 98%, bags.......... | 28.00 | 35.50 | 28.00 | 35.50 | 28.00 | 35.50 |
| Formaldehyde, aniline, 100 lb. drums..................lb. | .37½ | .42 | .37½ | .42 | .37½ | .42 |
| USP, 400 lb bbls wks......lb. | .06 | .07 | .06 | .07 | .06 | .07 |
| Fossil Flour..................lb. | .02½ | .04 | .02½ | .04 | .02½ | .04 |
| Fullers Earth, bulk, mines...ton | 15.00 | 20.00 | 15.00 | 20.00 | 15.00 | 20.00 |
| Imp. powd c-1 bags.......ton | 24.00 | 30.00 | 24.00 | 30.00 | 24.00 | 30.00 |
| Furfural (tech.) drums wks,. .lb. | .10§ | .15 | .10§ | .15 | .10 | .15 |
| Furfuramide (tech) 100 lb dr..lb. | .... | .30 | ..... | .30 | .... | .30 |
| Furfuryl Acetate, 1 lb tins....lb. | .... | 5.00 | ..... | 5.00 | .... | 5.00 |
| Fusel Oil, 10% impurities....lb. | .16 | .18 | .16 | .18 | .14½ | .18 |
| Fustic, chips..................lb. | .04 | .05 | .04 | .05 | .04 | .05 |

*& 10; †& 50 xTanks 2c lower.
‡Higher price, refined. §Tanks, 1c lower zHigher price is for purified.

| | Current Market | | 1934 Low | 1934 High | 1933 Low | 1933 High |
|---|---|---|---|---|---|---|
| Crystals, 100 lb boxes.....lb. | .20 | .23 | .20 | .23 | .18 | .23 |
| Liquid 50°, 600 lb bbls.....lb. | .08½ | .12 | .08½ | .12 | .07 | .10 |
| Solid, 50 lb boxes.........lb. | .16 | .18 | .16 | .18 | .14 | .18 |
| Sticks..................ton | 25.00 | 26.00 | 25.00 | 26.00 | 25.00 | 26.00 |
| G Salt paste, 360 lb bbls.....lb. | .42 | .43 | .42 | .43 | .42 | .43 |
| Gall Extract...............lb. | .18 | .20 | .18 | .20 | .18 | .20 |
| Gambier, common 200 lb cs..lb. | .04½ | .05½ | .04 | .05½ | .03 | .07 |
| Singapore cubes, 150 lb bg..lb. | .05¾ | .06¾ | .05¾ | .07 | .05¼ | .08 |
| Gelatin, tech, 100 lb cases.....lb. | .45 | .50 | .45 | .50 | .45 | .50 |
| Glauber's Salt, tech, c-l wks. ..................100 lb. | 1.10 | 1.30 | 1.10 | 1.30 | 1.00 | 1.70 |
| Glucose (grape sugar) dry 70-80° bags c-1 NY........100 lb. | 3.24 | 3.34 | 3.24 | 3.34 | 3.24 | 3.34 |
| Tanner's Special, 100 lb bags ..................100 lb. | .... | 2.33 | ..... | 2.33 | .... | 2.33 |
| Glue, bone, com.grades, c-l, bgs.lb. | .08 | .12½ | .08 | .12½ | .... | .... |
| Better grades, c-l, bags..lb. | .12½ | .16 | .12½ | .16 | .... | .... |
| Casein, kegs..............lb. | .18 | .22 | .18 | .22 | .... | .... |
| Hide, high grade, c-l, bags lb. | .23 | .28 | .23 | .28 | .... | .... |
| Medium grade, c-l, bags lb. | .19 | .23 | .19 | .23 | .... | .... |
| Low grade, c-l, bags.....lb. | .13½ | .19 | .13½ | .19 | .... | .... |
| Glycerin, CP, 550 lb drs......lb. | .12½ | .13 | .11 | .13 | .10¼ | .11 |
| Dynamite, 100 lb drs......lb. | .12¼ | .13 | .10 | .13 | .07½ | .10¼ |
| Saponification, tanks......lb. | .08 | .08½ | .06¾ | .08½ | .05 | .08 |
| Soap Lye, tanks..........lb. | .08¼ | .08½ | .06¼ | .08½ | .04 | .06½ |
| Glyceryl Stearate, bbls......lb. | .... | .18 | ..... | .18 | .17 | .18 |
| Graphite, | | | | | | |
| Crystalline, 500 lb. bbls...lb | .04 | 05 | .04 | .05 | .04 | .05 |
| Flake, 500 lb bbls.........lb. | .08 | .16 | .08 | .16 | .08 | .16 |
| Amorphous bbls............lb. | .03 | .04 | .03 | .04 | .03 | .04 |
| **Gums** | | | | | | |
| Gum Accroides, Red, coarse and fine 140-150 lb bags.......lb. | .03¾ | .04½ | .03¾ | .04½ | .03¾ | .04½ |
| Powd, 150 lb bags.........lb. | .06 | .06½ | .06 | .06½ | .06 | .06½ |
| Yellow. 150-200 lb bags....lb. | .18 | .20 | .18 | .20 | .18 | .20 |
| Aloes, Barbadoes ...........lb. | .87 | .90 | .85 | .90 | .85 | .90 |
| Animi (Zanzibar) bean & pea 250 lb cases............lb. | .35 | .40 | .35 | .40 | .35 | .40 |
| Glassy, 250 lb cases.......lb. | .50 | .55 | .50 | .55 | .50 | .55 |
| Arabic, amber sorts..........lb. | .08⅜ | .09 | .07¾ | .09 | .05¾ | .08¼ |
| Asphaltum, Barbadoes (Manjak) 200 lb bags............lb. | .03 | .06 | .03 | .06 | .03 | .05 |
| Egyptian, 200 lb cases.......lb. | .13 | .15 | .13 | .15 | .13 | .15 |
| Ester, light.................lb. | .06½ | .07 | .06 | .07 | .... | .... |
| Gamboge, pipe, cases........lb. | .60 | .65 | .57 | .65 | .42 | .65 |
| Powdered, bbls...........lb. | .70 | .75 | .67 | .75 | .50 | .70 |
| Gilsonite Selects, 200 lb bags ......................ton | 30.50 | 32.90 | 30.50 | 32.90 | 30.50 | 32.90 |
| Damar Batavia standard 136, lb. cases..................lb. | .12⅞ | .13½ | .12⅞ | .13½ | .08½ | .15½ |
| Batavia Dust, 160 lb bags.....lb. | .05¾ | .06 | .05¾ | .07 | .04 | .07½ |
| E Seeds, 136 lb cases.......lb. | .08½ | .09 | .08 | .09½ | .05½ | .09½ |
| F Splinters, 136 lb cases and bags..................lb. | .05½ | .06 | .05½ | .06 | .05½ | .06 |
| Singapore, No. 1, 224 lb cases .lb. | .16½ | .17 | .16½ | .18 | .09½ | .18 |
| No. 2, 224 lb cases........lb. | .10¼ | .10½ | .10¼ | .11 | .07 | .11½ |
| No. 3, 180 lb bags.........lb. | .05¾ | .06 | .05¾ | .07 | .04½ | .07½ |
| Benzoin Sumatra, U. S. P. 120 lb. cases..................lb. | .21 | .23 | .21 | .23 | .17 | .23 |
| Copal Congo, 112 lb bags, clean opaque...............lb. | .26 | .26½ | .26 | .28 | .16½ | .28 |
| Dark, amber..............lb. | .08⅝ | .09 | .08⅝ | .10½ | .06 | .10½ |
| Light, amber.............lb. | .14⅝ | .14⅞ | .14⅝ | .19 | .08 | .19 |
| Water. white.............lb. | .45 | .46 | .45 | .48 | .37 | .48 |
| Kino, tins..................lb. | .75 | .80 | .75 | .80 | .... | .... |
| Mastic.....................lb. | .37½ | .40 | .37½ | .40 | .26½ | .40 |
| Manila 180-190 lb baskets | | | | | | |
| Loba A..................lb. | 12¼ | .12¾ | .12¼ | .14½ | .09 | .13½ |
| Loba B..................lb. | .11¼ | .11¾ | .11¼ | .13½ | .08 | .13 |
| Loba C..................lb. | .10¾ | .11 | .10¾ | .12 | .07 | .12 |
| M A Sorts...............lb. | .06¾ | .07 | .06½ | .07½ | .05 | .07 |
| D B B Chips.............lb. | .08⅞ | .09½ | .08½ | .09½ | .05¾ | .09½ |
| East Indies chips, 180 lb bags lb. | .04½ | .05 | .04½ | .05 | .04 | .07 |
| Pale bold, 224 lb cs......lb. | .16 | .17 | .16 | .17 | .05½ | .17 |
| Pale nubs, 180 lb bags...lb. | .11 | .13 | .11 | .13 | .05 | .13 |
| Pontianak, 224 lb cases........ | | | | | | |
| Bold gen No. 1.........lb. | .17⅝ | .18⅛ | .17½ | .19 | .14 | .18½ |
| Gen. chips spot.........lb. | .07¼ | .08 | .07¼ | .08 | .05 | .08 |
| Elemi, No. 1, 80-85 lb cs.....lb. | .09¾ | .10 | .09¾ | .11½ | .09 | .12½ |
| No. 2, 80-85 lb cases.....lb. | .09¼ | .09½ | .09¼ | .11½ | .08½ | .12 |
| No. 3, 80-85 lb cases.....lb. | .08 | .08½ | .08 | .08½ | .08 | .08½ |
| Ghatti, sol. bags............lb. | .09 | .09½ | .09 | .09½ | .06 | .09½ |
| Karaya, pow. bbls xxx.......lb. | .23 | .25 | .23 | .25 | .... | .... |
| xx....................lb. | .15 | .16 | .15 | .16 | .... | .... |
| No. 1..................lb. | .10 | .11 | .10 | .11 | .... | .... |
| No. 2..................lb. | .08 | .09 | .08 | .09 | .... | .... |
| Kauri, 224-226 lb cases No. 1.lb. | .20 | .25 | .20 | .25 | .20 | .25 |
| No. 2 fair pale..........lb. | .12½ | .16 | .12½ | .16 | .12½ | .16 |
| Brown Chips, 224-226 lb. cases.................lb. | .06½ | .08½ | .06½ | .08½ | .06½ | .12 |
| Bush Chips, 224-226 lb. cases.................lb. | .22 | .24 | .22 | .24 | .22 | .24 |
| Pale Chips, 224-226 lb cases ......................lb. | .11½ | .14 | .11 | .14 | .11 | .14 |
| Sandarac, prime quality, 200 lb. bags & 300 lb. casks.....lb. | .48 | .50 | .48 | .50 | .21 | .50 |
| Senegal, picked bags.........lb. | .17 | .18 | .17 | .18 | .... | .... |
| Sorts....................lb. | .08¼ | .08⅝ | .08 | .08⅝ | .... | .... |
| Thus, bbls..............280 lbs. | .... | 9.50 | ..... | 9.50 | .... | .... |
| Strained...........280 lbs. | .... | 9.50 | ..... | 9.50 | .... | .... |
| Tragacanth, No. 1 bags......lb. | 1.15 | 1.20 | 1.00 | 1.20 | .65 | 1.00 |
| Yacca, bags................lb. | .... | .04 | ..... | .04 | .... | .... |
| Hematine crystals, 400 lb bbls lb. | .16 | .18 | .16 | .18 | .10 | .18 |
| Paste, 500 bbls.............lb. | .... | .11 | ..... | .11 | .... | .11 |
| Hemlock 25%, 600 lb bbls wks lb. | .03½ | .04½ | .03½ | .04½ | .03½ | .04½ |
| Bark.....................ton | .... | 16.00 | ..... | 16.00 | .... | 16.00 |
| Hexalene, 50 gal drs wks......lb. | .... | .30 | ..... | .30 | .... | .30 |
| Hexane, normal 60-70° C. Group 3, tanks........gal. | .... | .14 | ..... | .14 | .... | .... |
| Hexamethylenetetramine, drs lb. | .37 | .39 | .37 | .39 | .... | .... |
| Hoof Meal, f.o.b. Chicago...unit | .... | 2.50 | 1.85 | 2.60 | .75 | 1.75 |
| South Amer. to arrive....unit | 1.65 | 1.75 | 1.65 | 1.75 | 1.40 | 1.75 |

| | Current Market | | 1934 Low | 1934 High | 1933 Low | 1933 High |
|---|---|---|---|---|---|---|
| Hydrogen Peroxide, 100 vol, 140 lb cbys...lb. | .20 | .21 | .20 | .21 | .20 | .21 |
| Hydroxyamine Hydrochloride lb. | .... | 3.15 | ..... | 3.15 | .... | 3.15 |
| Hypernic, 51°, 600 lb bbls...lb. | .17 | .20 | .17 | .20 | .11 | .20 |
| Indigo Madras, bbls...lb. | 1.25 | 1.30 | 1.25 | 1.30 | 1.25 | 1.30 |
| 20% paste, drums...lb. | .15 | .18 | .15 | .18 | .15 | .18 |
| Synthetic, liquid...lb. | .... | .12 | ..... | .12 | .... | .12 |
| Iodine, crude...per kilo | .... | 15s 1d | ..... | 15s 1d | .... | .... |
| Resublimed, kegs...lb. | 2.25 | 2.30 | 2.25 | 2.30 | 2.10 | 3.40 |
| Irish Moss, ord. bales...lb. | .07 | .08 | .07 | .08 | .... | .... |
| Bleached, prime, bales...lb. | .14 | .15 | .14 | .15 | .... | .... |
| Iron Acetate Liq. 17°, bbls...lb.‡ | .03 | .04 | .03 | .04 | .... | .... |
| Iron Chloride see Ferric or Ferrous | | | | | | |
| Nitrate, kegs...lb. | .09 | .10 | .09 | .10 | .09 | .10 |
| Coml, bbls...100 lb. | 2.75 | 3.25 | 2.75 | 3.25 | 2.50 | 3.25 |
| Oxide, English...lb. | .08¾ | .09 | .08¾ | .09 | .04 | .07 |
| Isopropyl Acetate, tanks...lb. | .... | 07 | .07 | .07 | .... | .... |
| Japan Wax, 224 lb cases...lb. | .06¾ | .07 | .06 | .08 | .05½ | .08 |
| Keiselguhr, 95 lb bgs NY... | | | | | | |
| Brown...ton | 60.00 | 70.00 | 60.00 | 70.00 | 60.00 | 70.00 |
| Lead Acetate, bbls wks...100 lb. | .... | 9.50 | ..... | 9.50 | 8.50 | 9.50 |
| White crystals, 500 lb bbls wks...100 lb. | .... | 10.50 | ..... | 10.50 | 9.50 | 10.50 |
| Arsenate, drs 1c-1 wks...lb. | .09 | .17 | .09 | .18 | .09 | .10½ |
| Dithiofuroate, 100 lb dr...lb. | .... | 1.00 | ..... | 1.00 | .... | 1.00 |
| Linoleate, solid bbls...lb. | .26 | .26½ | .26 | .26½ | .... | .... |
| Metal, c-1 NY...100 lb. | .... | 4.00 | 4.00 | 4.15 | 3.00 | 4.50 |
| Nitrate, 500 lb bbls wks...lb. | .10 | .14 | .10 | .14 | .10 | .14 |
| Oleate, bbls...lb. | .15 | .16 | .15 | .16 | .15 | .16 |
| Lead Oxide Litharge, 500 lb. bbls...lb. | .... | .06¾ | ..... | .06¾ | .05½ | .07 |
| Red, 500 lb bbls wks...lb. | .... | .07¾ | ..... | .07¾ | .06½ | .08 |
| Resinate, precip., bbls...lb. | .18 | .18½ | .18 | .18½ | .... | .... |
| Stearate, bbls...lb. | .22 | .23 | .22 | .23 | .... | .... |
| White, 500 lb bbls wks...lb. | .06½ | .07 | .06½ | .07 | .06 | .07 |
| Sulfate, 500 lb bbls wk...lb. | .... | .06 | ..... | .06 | .05½ | .06 |
| Lime, ground stone bags...ton | .... | 4.50 | ..... | 4.50 | .... | 4.50 |
| Live, 325 lb bbls wks...bbl. | .... | 1.70 | ..... | 1.70 | .... | .... |
| Lime Salts, see Calcium Salts | | | | | | |
| Lime-Sulfur soln bbls...gal. | .14 | .33 | .14 | .33 | .15 | .17 |
| Linseed cake, bulk...ton | .... | 27.00 | 24.50 | 27.00 | 17.50 | 27.50 |
| Linseed Meal...ton | .... | 37.00 | ..... | 37.00 | 28.00 | 37.00 |
| Lithopone, 400 lb bbls lc-l wks lb. | .04¾ | .05 | .04¾ | .05 | .04¾ | .05 |
| Logwood, 51°, 600 lb bbls...lb. | .08½ | .12½ | .08½ | .12½ | .05 | .12½ |
| Solid, 50 lb boxes...lb. | .14½ | .17½ | .14½ | .17½ | .08 | .17½ |
| Sticks...ton | 24.00 | 26.00 | 24.00 | 26.00 | 24.00 | 26.00 |
| Madder, Dutch...lb. | .22 | .25 | .22 | .25 | .22 | .25 |
| Magnesite, calc, 500 lb bbl...ton | 60.00 | 65.00 | 55.00 | 65.00 | 46.00 | 65.00 |
| Magnesium Carb, tech, 70 lb. bags NY...lb. | .... | .06½ | ..... | .06½ | .05¾ | .06½ |
| Chloride flake, 375 lb. drs c-1 wks...ton | 36.00 | 39.00 | 34.00 | 39.00 | 34.00 | 36.00 |
| Imported shipment...ton | 31.75 | 33.00 | 31.75 | 33.00 | 31.75 | 33.00 |
| Fused, imp., 900 lb bbls NY ton | .... | 31.00 | ..... | 31.00 | .... | 31.00 |
| Fluosilicate, crys, 400 lb bbls. wks...lb. | .10 | .10½ | .10 | .10½ | .10 | .10½ |
| Oxide, USP, light, 100 lb bbls. lb. | .... | .42 | ..... | .42 | .... | .42 |
| Heavy, 250 lb bbls...lb. | .... | .50 | ..... | .50 | .... | .50 |
| Palmitate, bbls...lb. | .21 | .22 | .21 | .22 | .... | .... |
| Peroxide, 100 lb cs...lb. | 1.20 | 1.25 | 1.20 | 1.25 | 1.00 | 1.25 |
| Silicofluoride, bbls...lb. | .10 | .11 | .10 | .11 | .08¾ | .11 |
| Stearate, bbls...lb. | .19 | .20 | .19 | .20 | .16½ | .20 |
| Manganese Borate, 30%, 200 lb. bbls...lb. | .15 | .16 | .15 | .16 | .15 | .16 |
| Chloride, 600 lb casks...lb. | .07 | .08 | .07 | .08 | .07 | .08 |
| Dioxide, tech (peroxide) drs lb. | .03¾ | .06 | .03¾ | .06 | .03½ | .06 |
| Linoleate, lig. drums...lb. | .18 | .19 | .18 | .19 | .... | .... |
| Resinate, fused, bbls...lb. | .08¼ | .08½ | .08¼ | .08½ | .... | .... |
| precip., bbls...lb. | .11½ | .12½ | .11½ | .12½ | .... | .... |
| Sulfate, 550 lb drs NY...lb. | .... | .08 | ..... | .08 | .07 | .08 |
| Mangrove 55%, 400 lb bbls...lb. | .... | .04 | ..... | .04 | .... | .04 |
| Bark, African...ton | 27.00 | 28.00 | 27.00 | 31.00 | 22.00 | 31.00 |
| Marble Flour, bulk...ton | 12.00 | 13.00 | 12.00 | 13.00 | 12.00 | 13.00 |
| Mercuric chloride...lb. | .... | .88 | .82 | .88 | .67 | .87 |
| Mercury metal...76 lb flask | 76.00 | 78.00 | 66.50 | 79.00 | 48.00 | 69.00 |
| Meta-nitro-aniline...lb. | .67 | .69 | .67 | .69 | .67 | .69 |
| Meta-nitro-para-toluidine 200 lb. bbls...lb. | 1.40 | 1.55 | 1.40 | 1.55 | 1.40 | 1.55 |
| Meta-phenylene-diamine 300 lb. bbls...lb. | .80 | .84 | .80 | .84 | .80 | .84 |
| Meta-toluene-diamine, 300 lb. bbls...lb. | .67 | .69 | .67 | .69 | .67 | .69 |
| Methanol, (Wood Alcohol)... | | | | | | |
| *Crude, tanks...gal. | .... | .25 | ..... | .25 | .20 | .20 |
| 95% tanks...gal. | .33 | .35 | .33 | .35 | .33 | 35 |
| 97% tanks...gal. | .34 | .39 | .34 | .39 | .34 | .39 |
| *Pure, Synthetic drums cars gal. | .... | .40 | ..... | .40 | .37½ | .40 |
| *Synthetic tanks...gal. | .... | .35½ | ..... | .35½ | .... | .35½ |
| *Denat. grade, tanks...gal. | .... | .43 | .40 | .43 | .35 | .40 |
| Methyl Acetate drums 82% gal. | .12 | .13 | 12 | .13 | .12 | .13 |
| 99% tanks...gal. | .... | .15 | ..... | .15 | .... | .15 |
| Acetone, drums...gal. | .54½ | .57 | .54½ | .57 | .42 | .57 |
| Hexyl Ketone, pure...lb. | .... | 1.20 | ..... | 1.20 | .... | 1.20 |
| Anthraquinone...lb. | .65 | .67 | .65 | .67 | .65 | .67 |
| Butyl Ketone, tanks...lb | .... | .10½ | .10½ | .10½ | .... | .... |
| Cellosolve, (See Ethylene Glycol Mono Methyl Ether) | .... | .... | ..... | ..... | .... | .... |
| Chloride, 90 lb cyl...lb. | .45 | .45 | .45 | .45 | .45 | .45 |
| Ethyl Ketone, tanks...lb. | .... | .07½ | .07½ | .07½ | .... | .... |
| Mica, dry grd. bags wks...lb. | 65.00 | 80.00 | 65.00 | 80.00 | 65.00 | 80.00 |
| Michler's Ketone, kegs...lb. | .... | 2.50 | ..... | 2.50 | 2.50 | 3.00 |
| Molasses, blackstrap, tanks f.o.b. N. Y...gal. | .08½ | .09 | .06½ | .09 | .04½ | .07 |
| Monochlorobenzene, drums, see Chlorobenzene, mono...lb. | | | | | | |
| Monomethylparaminosulfate 100 lb drums...lb. | 3.75 | 4.00 | 3.75 | 4.00 | 3.75 | 4 00 |
| Montan Wax, crude, bags...lb. | .10½ | .11 | .10 | .11 | .03¾ | .10 |
| Myrobalans 20%, liq bbls...lb. | .03¾ | .04¼ | .03¾ | .04¼ | .03¼ | .04¼ |
| 50% Solid, 50 lb boxes...lb. | .06 | .06¼ | .06 | .06¼ | .05 | .06¼ |

*delivered basis (east of Miss. River) †As of Sept. 1, $2.56.
‡Higher price is for lcl quantities.

# *Current*

**Myrobalans**
**Phenyl-Alpha-Naphthylamine**

| | Current Market | 1934 Low | 1934 High | 1933 Low | 1933 High |
|---|---|---|---|---|---|
| J1 bags...ton | .... | 27.00 | 27.00 | 32.00 | 27.00 | 35.00 |
| J2 bags...ton | 17.50 | 18.50 | 17.50 | 18.50 | 15.50 | 22.75 |
| R2 bags...ton | .... | 16.50 | 16.50 | 18.00 | 15.00 | 22.00 |
| Naphtha, v.m.& p. (deodorized) tanks, Group 3 tanks...gal. | .06⅞ | .07¼ | .06⅞ | .07¼ | .... | .... |
| Bayonne, tanks...lb. | .... | .09½ | ..... | .09½ | .08½ | .09½ |
| Naphthalene balls, 250 lb bbls wks...lb. | .06 | .07 | .06 | .07 | .05½ | .07 |
| Crude, imp...100 lb. | .... | 1.75 | 1.75 | 2.15 | 1.75 | 2.15 |
| Crushed, chipped bgs wks...lb. | .... | .05 | ..... | .05 | .... | .05 |
| Flakes, 175 lb bbls wks...lb. | .... | .07¼ | ..... | .07¼ | .... | .07¼ |
| Nickel Chloride, bbls...lb. | .18 | .19 | .18 | .19 | .17 | .19 |
| Oxide, 100 lb kegs NY...lb. | .35 | .37 | .35 | .37 | .35 | .37 |
| Salt bbl. 400 bbls lb NY...lb. | .11½ | .12 | .11½ | .12 | .11 | .13 |
| Single, 400 lb bbls NY...lb. | .11½ | .12 | .11½ | .12 | .11 | .12 |
| Metal ingot...lb. | .35 | .35 | .35 | .35 | .35 | .35 |
| Nicotine, free 40%, 8 lb tins, cases... | 8.25 | 10.15 | 8.25 | 10.15 | .... | .... |
| Sulfate, 55 lb. drums...lb. | .67 | .75 | .67 | .75 | .67 | .75 |
| Nitre Cake, bulk...ton | 12.00 | 14.00 | 12.00 | 14.00 | 10.00 | 14.00 |
| Nitrobenzene, redistilled, 1000 lb drs wks*...lb. | .08½ | .11 | .08½ | .11 | .08½ | .11 |
| Nitrocellulose, c-l-l-cl, wks...lb. | .27 | .33 | .27 | .33 | .27 | .33 |
| Nitrogenous Material, bulk.unit | .... | 3.25 | 2.40 | 3.25 | 1.50 | 3.50 |
| Nitronaphthalene, 550 lb bbls.lb. | .24 | .25 | .24 | .25 | .24 | .25 |
| Nutgalls Aleppy, bags...lb. | .... | .18 | ..... | .18 | .... | .18 |
| Chinese, bags...lb. | .17 | .18 | .17 | .18 | .17 | .18 |
| Oak Bark, ground...ton | 30.00 | 35.00 | 30.00 | 35.00 | 30.00 | 35.00 |
| Whole...ton | 20.00 | 23.00 | 20.00 | 23.00 | 20.00 | 23.00 |
| Extract, 25% tannin, bbls..lb. | .03⅜ | .03½ | .03⅜ | .03½ | .... | .... |
| Orange-Mineral, 1100 lb casks NY...lb. | .... | .10½ | ..... | .10½ | 09½ | .10¾ |
| Orthoaminophenol, 50 lb kgs..lb. | 2.15 | 2.25 | 2.15 | 2.25 | 2.15 | 2.25 |
| Orthoanisidine, 100 lb drs...lb. | 1.00 | 1.15 | 1.00 | 1.15 | 1.00 | 1.15 |
| Orthochlorophenol, drums...lb. | .50 | .65 | .50 | .65 | .50 | .65 |
| Orthocresol, drums...lb. | .13 | .15 | .13 | .15 | .13 | .15 |
| Orthodichlorobenzene, 1000 lb. drums...lb. | .05½ | .06 | .05½ | .06 | .05½ | .06 |
| Orthonitrochlorobenzene, 1200 lb drs wks...lb. | .28 | .29 | .28 | .29 | .28 | .29 |
| Orthonitrotoluene, 1000 lb drs wk...lb. | .05½ | .06 | .05½ | .06 | .05½ | .06 |
| Orthonitrophenol, 350 lb dr...lb. | .52 | .80 | .52 | .80 | .52 | .90 |
| Orthotoluidine, 350 lb bbl 1c-1 lb. | .14 | .15 | .14 | .15 | .14 | .22 |
| Orthonitroparachlorphenol, tins...lb. | .70 | .75 | .70 | .75 | .70 | .75 |
| Osage Orange, crystals...lb. | .16 | .17 | .16 | .17 | .16 | .17 |
| 51 deg. liquid...lb. | .07 | .07¾ | .07 | .07¾ | .06 | .07¾ |
| Powdered, 100 lb bags...lb. | .14½ | .15 | .14½ | .15 | .14½ | .15 |
| Paraffin, refd, 200 lb cs slabs 123-127 deg. M. P...lb. | .047 | .04¾ | .04½ | .04¾ | .02 | .04½ |
| 128-132 deg. M. P...lb. | .04¾ | .0515 | .04¾ | .0515 | .03⅛ | .04¾ |
| 133-137 deg. M. P...lb. | .0575 | .07 | .05 | .07 | .043 | .05¾ |
| Para Aldehyde, 110-55 gal drs.lb.* | .16 | .18 | .16 | .18 | .16 | .18 |
| Aminoacetanilid, 100 lb bg..lb. | .52 | .60 | .52 | .60 | .52 | .60 |
| Aminohydrochloride, 100 lb. kegs...lb. | 1.25 | 1.30 | 1.25 | 1.30 | 1.25 | 1.30 |
| Aminophenol, 100 lb kegs...lb. | .78 | .80 | .78 | .80 | .78 | .80 |
| Chlorophenol, drums...lb. | .50 | .65 | .50 | .65 | .50 | .65 |
| Coumarone, 330 lb drums..lb. | .... | .... | ..... | ..... | .... | .... |
| Cymene, refd, 110 gal dr..gal. | 2.25 | 2.50 | 2.25 | 2.50 | 2.25 | 2.50 |
| Dichlorobenzene, 150 lb bbls wks...lb. | .16 | .20 | .16 | .20 | .15 | .18 |
| Nitroacetanilid, 300 lb bbls lb. | .45 | .52 | .45 | .52 | .45 | .52 |
| Nitroaniline, 300 lb bbls wks...lb. | .48 | .55 | .48 | .55 | .48 | .55 |
| Nitrochlorobenzene, 1200 lb drs wks...lb. | .23½ | .24 | .23½ | .24 | .23½ | .26 |
| Nitro-orthotoluidine, 300 lb. bbls...lb. | 2.75 | 2.85 | 2.75 | 2.85 | 2.75 | 2.85 |
| Nitrophenol 185 lb bbls...lb. | .45 | .50 | .45 | .50 | .45 | .50 |
| Nitrosodimethylaniline, 120 lb. bbls...lb. | .92 | .94 | .92 | .94 | .92 | .94 |
| Nitrotoluene, 350 lb bbls...lb. | .35 | .37 | .35 | .37 | .29 | .37 |
| Phenylenediamine, 350 lb bbls...lb. | 1.25 | 1.30 | 1.25 | 1.30 | 1.15 | 1.30 |
| Toluenesulfonamide, 175 lb bbls...lb. | .70 | .75 | .70 | .75 | .70 | .75 |
| Toluenesulfonchloride, 410 lb bbls wks...lb. | .20 | .22 | .20 | .22 | .20 | .22 |
| Toluidine, 350 lb bbls wk..lb. | .56 | .60 | .56 | .60 | .56 | .60 |
| Paris Green, Arsenic Basis 100 lb kegs...lb. | .... | .23 | ..... | .23 | .... | .24 |
| 250 lb kegs...lb. | .... | .22 | ..... | .22 | .... | .23 |
| Perchlorethylene, 50 gal. dr...lb | .... | .15 | ..... | .15 | .... | .... |
| Persian Berry Ext., bbls...lb. | .25 | Nom. | .25 | Nom | .25 | Nom |
| Pentane, normal, 28-38° C, group 3, tanks...gal. | .... | .09 | ..... | .09 | .... | .... |
| Pentasol (see Alcohol, Amyl)... | | | | | | |
| Pentasol Acetate (see Amyl Acetate)... | | | | | | |
| Petrolatum, Green, 300 lb bbl. lb. | .01⅞ | .02 | .01⅞ | .02 | .01⅞ | .02 |
| Petroleum Ethers, tanks 30-60°, Group 3...gal. | .... | .13 | .11 | .13 | .10 | .11 |
| Petroleum solvents and diluents Cleaners' naphtha, Group 3, tanks...gal. | .06⅞ | .07⅜ | .06⅞ | .07⅜ | .05 | .07⅜ |
| Lacquer diluents, Bayonne tanks...gal. | .12 | .12½ | .12 | .12½ | .12 | .12¾ |
| Group 3, tanks...gal. | .06⅞ | .07⅞ | .06⅞ | .08⅜ | .06¼ | .08⅛ |
| Petroleum thinner 47-49 deg. tanks, Group 3...gal. | .05⅞ | .06⅜ | .05⅞ | .06⅜ | .... | .... |
| Rubber solvent, stand. grade tanks, Group 3...gal. | .... | .06⅞ | ..... | 06⅞ | .05 | .06⅞ |
| East Coast tanks...gal. | .... | .09½ | ..... | .09½ | .09 | .09½ |
| Stoddard solvents 48-50 deg. tanks, Group 3...gal. | .06⅜ | .06⅝ | .06⅝ | .07½ | .04½ | .06⅝ |
| East Coast tanks...gal. | .... | .09½ | ..... | .09½ | .09 | .09½ |
| Phenol, 250-100 lb drums...lb. | .14¼ | .15 | .14¼ | .15 | .14¼ | .15 |
| Phenyl-Alpha-Naphthylamine, 100 lb kegs...lb. | .... | 1.35 | ..... | 1.35 | .... | 1.35 |

*Higher price is for lcl quantities.

# Prices

| | Current Market | | 1934 Low | 1934 High | 1933 Low | 1933 High |
|---|---|---|---|---|---|---|
| Phenyl Chloride, drums......lb. | .... | .16 | ..... | .16 | .... | .... |
| Phenylhydrazine Hydrochloride ..........lb. | 2.90 | 3.00 | 2.90 | 3.00 | 2.90 | 3.00 |
| Phosphate Acid (see Superphosphate) | | | | | | |
| Phosphate Rock, f.o.b. mines | | | | | | |
| Florida Pebble, 68% basis..ton | 2.85 | 3.20* | 2.85 | 3.20* | 2.75 | 3.25 |
| 70% basis..........ton | 3.35 | 3.70* | 3.35 | 3.70* | 3.25 | 3.90 |
| 72% basis..........ton | 3.85 | 4.20* | 3.85 | 4.20* | 3.75 | 4.35 |
| 75-74% basis..........ton | 4.90 | 5.30* | 4.90 | 5.30* | 4.75 | 5.50 |
| 75% basis..........ton | 5.05 | 5.40* | 5.05 | 5.40* | 4.85 | 5.75 |
| 77-80% basis..........ton | 5.90 | 6.20* | 5.90 | 6.20* | 5.75 | 6.30 |
| Tennessee, 72% basis.....ton | .... | 5.00* | ..... | 5.00* | .... | 5.00 |
| Phosphorous Oxychloride 175 lb cyl..........lb. | .16 | .20 | .16 | .20 | .16 | .23 |
| Red, 110 lb cases.......lb. | .44 | .45 | .44 | .45 | .40 | .45 |
| Yellow, 110 lb cases wks.lb. | .28 | .33 | .28 | .33 | .27½ | .33 |
| Sesquisulfide, 100 lb cs.....lb. | .38 | .44 | .38 | .44 | .38 | .44 |
| Trichloride, cylinders......lb. | .16 | .20 | .16 | .20 | .16 | .23 |
| Phthalic Anhydride, 100 lb bbls wks..........lb. | .14½ | .15 | .14½ | .15 | .13½ | .16 |
| Pigments Metallic, Red or brown bags, bbls, Pa. wks.....ton | 37.00 | 45.00 | 37.00 | 45.00 | 37.00 | 45.00 |
| Pine Oil, 55 gal drums or bbls | | | | | | |
| Destructive dist..........lb. | .59 | .62 | .59 | .62 | .59 | .62 |
| Steam dist. wat. wh. bbls..gal. | .64 | .65 | .64 | .65 | .... | .... |
| Prime bbls..........bbl. | 8.00 | 10.60 | 8.00 | 10.60 | 8.00 | 10.60 |
| Pitch Hardwood.......... wks..........ton | .... | 20.00 | ..... | 20.00 | 20.00 | 25.00 |
| Plaster Paris, tech, 250 lb bbls ..........bbl. | 3.40 | 3.50 | 3.40 | 3.50 | 3.30 | 3.50 |
| Platinum, Refined..........oz. | 37.00 | 38.00 | 37.00 | 38.00 | 24.00 | 38.00 |
| Pontol, tanks ..........per gal. | .... | .54 | ..... | .54 | .... | .54 |
| Potash, Caustic, wks, solid...lb. | .07⅜ | .07⅝ | .07⅜ | .07⅝ | .06⅜ | .07⅝ |
| flake..........lb. | .0803 | .08¼ | .0803 | .08¼ | .0705 | .08¼ |
| Liquid, tanks ..........lb. | .... | .03⅝ | ..... | .03⅝ | .... | .... |
| Potash Salts, Rough Kainit | | | | | | |
| 12.4% basis bulk.......ton | .... | 9.20 | ..... | 9.20 | .... | 9.20 |
| 14% basis..........ton | .... | 9.70 | ..... | 9.70 | .... | 9.70 |
| Manure Salts.......... | | | | | | |
| 20% basis bulk.........ton | .... | 12.00 | ..... | 12.00 | .... | 12.00 |
| 30% basis bulk.........ton | .... | 19.15 | ..... | 19.15 | .... | 19.15 |
| Potassium Acetate..........lb. | .27 | .28 | .27 | .28 | .27 | .28 |
| Potassium Muriate, 80% basis bags..........ton | .... | 37.15 | ..... | 37.15 | .... | 37.15 |
| Pot. & Mag. Sulfate, 48% basis bags..........ton | .... | 25.00 | ..... | 25.00 | 25.00 | 27.80 |
| Potassium Sulfate, 90% basis bags..........ton. | .... | 42.15 | .... | 42.15 | 42.15 | 47.50 |
| Potassium Bicarbonate, USP, 320 lb bbls..........lb. | .07½ | .09 | .07½ | .09 | .07½ | .09 |
| Bichromate Crystals, 725 lb casks..........lb. | .08⅛ | .08⅜ | .08⅛ | .08⅜ | .07¼ | .08⅜ |
| Binoxalate, 300 lb bbls.....lb. | .14 | .17 | .14 | .17 | .14 | .17 |
| Bisulfate, 100 lb kegs......lb. | .16 | .30 | .16 | .30 | .16 | .30 |
| Carbonate, 80-85% calc. 800 lb casks..........lb. | .07 | .07½ | .07 | .07½ | .04⅜ | .07½ |
| Chlorate crystals, powder 112 lb keg wks..........lb. | .... | .09 | .08½ | .09 | .08 | .09 |
| Chloride, crys bbls.........lb. | .04 | .04¾ | .04 | .04¾ | .04 | .04¾ |
| Chromate, kegs..........lb. | .23 | .28 | .23 | .28 | .23 | .28 |
| Cyanide, 110 lb. cases.....lb. | .55 | .60 | .55 | .60 | .50 | .60 |
| Iodide, 75 lb. bbls..........lb. | 1.75 | 1.90 | 1.75 | 2.70 | 2.35 | 2.70 |
| Metabisulfite, 300 lb. bbl...lb. | .10½ | .11 | .10½ | .11 | .10½ | .11 |
| Oxalate, bbls..........lb. | .16 | .24 | .16 | .24 | .16 | .24 |
| Perchlorate, casks wks.....lb. | .09 | .11 | .09 | .11 | .09 | .11 |
| Permanganate, USP, crys 500 & 100 lb drs wks..........lb. | .18½ | .19½ | .18½ | .19½ | .17½ | .19½ |
| Prussiate, red, 112 lb keg...lb. | .39 | .41 | .35 | .39 | .39 | .41 |
| Yellow, 500 lb casks.....lb. | .18 | .19 | .18 | .19 | .16½ | .19 |
| Tartrate Neut, 100 lb keg...lb. | .... | .21 | ..... | .21 | .... | .21 |
| Titanium Oxalate, 200 lb bbls ..........lb. | .32 | .35 | .32 | .35 | .... | .... |
| Propane, group 3, tanks.......... | .... | .07 | ..... | .07 | .... | .07 |
| Pumice Stone, lump bags.....lb. | .04½ | .06 | .04½ | .06 | .04 | .06 |
| 250 lb bbls..........lb. | .05 | .07 | .05 | .07 | .04½ | .07 |
| Powdered, 350 lb bags.....lb. | .02½ | .03 | .02½ | .03 | .02½ | .03 |
| Putty, commercial, tubs..100 lb. | .... | 2.25 | ..... | 2.25 | 2.00 | 2.25 |
| Linseed Oil, kegs......100 lb. | 4.00 | 4.50 | 4.00 | 4.50 | 3.40 | 4.50 |
| Pyridine, 50 gal drums .....gal. | .... | 1.25 | ..... | 1.25 | .85 | 1.25 |
| Pyrites, Spanish cif Atlantic ports bulk..........unit | .12 | .13 | .12 | .13 | .12 | .13 |
| Quebracho, 35% liquid tks...lb. | .... | .02¼ | .02¼ | .02⅜ | .02 | .02⅜ |
| 450 lb bbls c-1 ..........lb. | .02¾ | .02⅞ | .02¾ | .02⅞ | .02⅜ | .02⅞ |
| Solid, 63%, 100 lb bales cif..lb. | .... | .02⅞ | .02⅞ | .03⅜ | .02⅜ | .03⅜ |
| Clarified, 64%, bales... lb. | .... | .03 | .03 | .03½ | .02⅜ | .03½ |
| Quercitron, 51 deg liquid 450 lb bbls ..........lb. | .06 | .06½ | .05½ | .06½ | .05½ | .06 |
| Solid, 100 lb boxes.........lb. | .10 | .12 | .09½ | .13 | .09½ | .13 |
| Bark, Rough..........ton | .... | 14.00 | ..... | 14.00 | .... | 14.00 |
| Ground..........ton | 34.00 | 35.00 | 34.00 | 35.00 | 34.00 | 35.00 |
| R Salt, 250 lb bbls wks......lb. | .40 | .44 | .40 | .44 | .40 | .44 |
| Red Sanders Wood, grd bbls. lb. | .... | .18 | ..... | .18 | .... | .18 |
| Resorcinol Tech, cans.........lb. | .65 | .75 | .65 | .75 | .65 | .70 |
| Rochelle Salt, cryst..........lb. | .14¼ | .14½ | .12½ | 14½ | .... | .... |
| Rosin Oil, 50 gal bbls, first run ..........gal. | .... | .48 | .45 | .48 | .42 | .46 |
| Second run..........gal. | .... | .53 | .50 | .53 | .46 | .51 |
| FF Wood Rosin, c. l. N. Y..... | .... | 6.13 | 5.05 | 6.13 | .... | .... |
| Rosins 600 lb bbls 280 lb.....unit ex. yard N. Y. | | | | | | |
| B.......... | .... | 5.60 | 4.50 | 5.75 | 2.75 | 5.15 |
| D.......... | .... | 5.85 | 4.60 | 5.85 | 2.95 | 5.15 |
| E.......... | .... | 6.15 | 4.80 | 6.50 | 3.55 | 5.15 |
| F.......... | .... | 6.40 | 5.00 | 6.75 | 3.85 | 5.17½ |
| G.......... | .... | 6.40 | 5.05 | 6.75 | 3.90 | 5.17½ |
| H.......... | .... | 6.40 | 5.10 | 6.75 | 4.00 | 5.17½ |
| I.......... | .... | 6.42½ | 5.15 | 6.75 | 4.05 | 5.20 |
| K.......... | .... | 6.42½ | 5.30 | 6.75 | 4.60 | 5.20 |
| M.......... | .... | 6.42½ | 5.50 | 6.80 | 4.35 | 5.25 |
| N.......... | .... | 6.45 | 5.50 | 6.80 | 4.75 | 5.40 |

*Higher prices run to Jan.-June 1935.

# Current

**Rosin**
**Starch, Potato**

| | Current Market | 1934 Low | 1934 High | 1933 Low | 1933 High |
|---|---|---|---|---|---|
| Rosin, WG | .... | 6.45 | 5.95 | 6.80 | 4.80 | 5.60 |
| WW | .... | 6.50 | ..... | 6.85 | 4.85 | 6.20 |
| Rotten Stone, bags mines....ton | 23.50 | 24.00 | 23.50 | 24.00 | 23.50 | 24.00 |
| Lump, imported, bbls......lb. | .05 | .07 | .05 | .07 | .05 | .07 |
| Selected bbls............lb. | .09 | .12 | .09 | .12 | .09 | .12 |
| Powdered, bbls...........lb. | .02½ | .05 | .02½ | .05 | .02 | .05 |
| Sago Flour, 150 lb bags......lb. | .02½ | .03 | .02½ | .03 | .02½ | .03 |
| Sal Soda, bbls wks......100 lb. | 1.10 | 1.10 | 1.10 | 1.10 | .90 | 1.10 |
| Salt Cake, 94-96% c-1 wks...ton | 13.00 | 18.00 | 13.00 | 18.00 | 13.00 | 18.00 |
| Chrome...............ton | 12.00 | 13.00 | 12.00 | 13.00 | 12.00 | 13.00 |
| Saltpetre, double refd granular 450-500 lb bbls..........lb. | .... | .06 | ..... | .06 | .05¾ | .06¾ |
| Satin, White, 500 lb bbls.....lb. | .... | .01½ | ..... | .01½ | .... | .01½ |
| Shellac Bone dry bbls........lb. | .29 | .31 | .29 | .31 | .18 | .28 |
| Garnet, bags..............lb. | .24 | .25 | .24 | .25 | .15 | .20 |
| Superfine, bags............lb. | .23 | .23¾ | .23 | .23¾ | .09½ | .18¾ |
| T. N. bags...............lb. | .21 | .21¾ | .21 | .21¾ | .08½ | .17¾ |
| Schaeffer's Salt kegs........lb. | .48 | .50 | .48 | .50 | .48 | .50 |
| Silica, Crude, bulk mines....ton | 8.00 | 11.00 | 8.00 | 11.00 | 8.00 | 11.00 |
| Refined, floated bags......ton | 22.00 | 30.00 | 22.00 | 30.00 | 22.00 | 30.00 |
| Air floated bags.........ton | .... | 32.00 | ..... | 32.00 | .... | 32.00 |
| Extra floated bags......ton | 30.00 | 35.00 | 30.00 | 35.00 | 30.00 | 35.00 |
| Silver Nitrate, vials.........oz. | .33⅜ | .35⅜ | .32¼ | .35⅜ | .... | .... |
| Soapstone, Powdered, bags f.o.b. mines..................ton | 15.00 | 22.00 | 15.00 | 22.00 | 15.00 | 22.00 |
| Soda Ash, 58% dense, bags c-1 wks...............100 lb. | .... | 1.25 | ..... | 1.25 | 1.17½ | 1.25 |
| 58% light, bags.......100 lb. | .... | 1.23 | ..... | 1.23 | 1.15 | 1.23 |
| Soda Caustic, 76% grnd & flake drums.............100 lb. | .... | 3.00 | ..... | 3.00 | 2.90 | 3.00 |
| 76% solid drs.........100 lb. | .... | 2.60 | ..... | 2.60 | 2.50 | 2.60 |
| Liquid sellers tanks, 100 bls. | .... | 2.25 | ..... | 2.25 | 2.15 | 2.25 |
| Sodium Abietate, drs........lb. | .... | .06 | .03 | .06 | .... | .03 |
| Acetate, tech 450 lb. bbls wks lb. | .04¾ | .05 | .04¾ | .05 | .04½ | .05 |
| Alignate, drs..............lb. | .... | .50 | ..... | .50 | .... | .50 |
| Arsenate, drums...........lb. | .07¾ | .08¾ | .07¾ | .08¾ | .07¾ | .08¾ |
| Arsenite, drums...........gal. | .50 | .75 | .50 | .75 | .05 | .75 |
| Benzoate U.S.P., kegs......lb. | .45 | .47 | .45 | .47 | .... | .... |
| Bicarb, 400 lb bbl.....100 lb. | .... | 2.25 | ..... | 2.25 | .... | 2.25 |
| Bichromate, 500 lb cks wks lb. | .06⅛ | .06⅝ | .06⅛ | .06⅝ | .044 | .07 |
| Bisulfite, 500 lb bbl wks....lb. | .03 | .0335 | .03 | .0335 | .02¾ | .0335 |
| Chlorate, wks.............lb. | .06¼ | .07½ | .06¼ | .07½ | .05¾ | .07¾ |
| Chloride, technical.......ton | 11.40 | 14.00 | 11.40 | 14.00 | 11.40 | 14.00 |
| Cyanide, 96-98%, 100 & 250 lb drums wks............lb. | .... | .16½ | ..... | .16½ | .15½ | .16 |
| Fluoride, 300 lb bbls wks....lb. | .07½ | .09½ | .07½ | .09½ | .07 | .07½ |
| Hydrosulfite, 200 lb bbls f.o.b. wks..................lb. | .19½ | .21 | .19½ | .21 | .20 | .21 |
| Hypochloride solution, 100 lb. cbys..................lb. | .... | .05 | ..... | .05 | .... | .05 |
| Hyposulfite, tech, pea cyrs 375 lb bbls wks......100 lb. | 2.40 | 3.00 | 2.40 | 3.00 | 2.40 | 3.00 |
| Technical, regular crystals 375 lb bbls wks....100 lb. | 2.40 | 2.65 | 2.40 | 2.65 | 2.40 | 2.65 |
| Iodide,...................lb. | .... | 3.50 | ..... | 3.50 | 3.10 | 3.50 |
| Metanilate, 150 lb bbls....lb. | .41 | .42 | .41 | .42 | .44 | .45 |
| Metasilicate, c-1, wks..100 lb. | 2.65 | 3.05 | 2.65 | 3.05 | 2 65 | 3.25 |
| Monohydrate, bbls.........lb. | .... | .02½ | ..... | .02½ | .... | .02½ |
| Naphthionate, 300 lb bbl...lb. | .52 | .54 | .52 | .54 | .52 | .54 |
| Nitrate, 92%, crude, 200 lb. bags c-1 NY .....100 lb. | .... | 1.31½ | ..... | 1.31½ | 1.26 | 1.31½ |
| 100 lb. bags lb. .......ton | .... | 27.00 | ..... | 27.00 | .... | .... |
| Bulk..................ton | .... | 24.50 | ..... | 24.50 | .... | .... |
| Nitrite, 500 lb bbls spot....lb. | .07¼ | .08 | .07¼ | .08 | .07¼ | .08 |
| Orthochlorotoluene, sulfonate, 175 lb bbls wks.......lb. | .25 | .27 | .25 | .27 | .25 | .27 |
| Perborate, 275 lb bbls.....lb. | .18 | .19 | .18 | .19 | .17 | .19 |
| Peroxide, bbls. 400 lb. ....lb. | .... | .17 | ..... | .17 | .... | .... |
| Phosphate, di-sodium, tech. 310 lb bbls.......100 lb. | 2.20 | 2.40 | 2.20 | 2.40 | 2.00 | 2.40 |
| tri-sodium, tech, 325 lb bbls...............100 lb. | .... | 2.60 | ..... | 2.60 | 2.15 | 2.50 |
| Picramate, 160 lb kegs ....lb. | .69 | .72 | .69 | .72 | .69 | .72 |
| Prussiate, Yellow, 350 lb bbl wks..................lb. | .11½ | .12 | .11½ | .12 | .11½ | .12 |
| Pyrophosphate, 100 lb keg..lb. | .16½ | .18 | .16½ | .18 | .15 | .20 |
| Silicate, 60 deg 55 gal drs, wks ................100 lb. | 1.65 | 1.70 | 1.65 | 1.70 | 1.65 | 1.70 |
| 40 deg 55 gal drs, wks ................100 lb. | .... | .80* | ..... | .80* | .75 | .80 |
| Silicofluoride, 450 lb bbls NY ......................lb. | .04¾ | .05 | .04¾ | .06 | .04½ | .06 |
| Stannate, 100 lb drums.....lb. | .... | .35½ | .34 | .37 | .18 | .37 |
| Stearate, bbls.............lb. | .20 | .25 | .20 | .25 | .20 | .25 |
| Sulfanilate, 400 lb bbls.....lb. | .16 | .18 | .16 | .18 | .16 | .18 |
| Sulfate Anhyd, 550 lb bbls c-1 wks.............lb. | .022 | .0285 | .022 | .0285 | .02 | .0285 |
| Sulfide, 80% crystals, 440 lb bbls wks.............lb. | .... | .02¼ | .02¼ | .02½ | .02½ | .02¾ |
| 62% solid, 650 lb drums c. l. wks.............lb. | .... | .03 | ..... | .03 | .... | .03 |
| Sulfite, crystals, 400 lb bbls wks.................lb. | .02¼ | .02½ | .02¼ | .02½ | .03 | .03¼ |
| Sulfocyanide, bbls ........lb. | .28 | .35 | .28 | .35 | .28 | .35 |
| Tungstate, tech, crystals, kegs ......................lb. | .70 | .75 | .70 | .75 | .57 | .67 |
| Spermaceti, blocks, cases.....lb. | .19 | .20 | .18 | .20 | .17 | .22 |
| Cakes, cases.............lb. | .20 | .21 | .19 | .21 | .18 | .23 |
| Spruce Extract, ord., tanks..lb. | .... | .01 | ..... | .01 | .00⅞ | .01 |
| Ordinary, bbls..........lb. | .... | .01½ | ..... | .01½ | .01¼ | .01½ |
| Super spruce ext., tanks...lb. | .... | .01⅝ | ..... | .01⅝ | .01¼ | .01⅝ |
| Super spruce ext., bbls....lb. | .... | .01⅞ | ..... | .01⅞ | .01⅝ | .01⅞ |
| Super spruce ext. powd., bags ......................lb. | .... | .04 | ..... | .04 | .... | .04 |
| Starch, powd, 140 lb bags ....................100 lb. | 2.81 | 3.01 | 2.81 | 3.01 | 2.29 | 3.01 |
| Pearl, 140 lb bags.....100 lb. | 2.71 | 2.91 | 2.71 | 2.91 | 2.19 | 2.91 |
| Potato, 200 lb bags........lb. | .05½ | .06 | .05½ | .06 | .03¾ | .06 |
| Imported bags..........lb. | .06 | .06½ | .06 | .06½ | .04¾ | .06½ |

*Tanks, 15c less.

# *Prices*

| | Current Market | | 1934 Low | 1934 High | 1933 Low | 1933 High |
|---|---|---|---|---|---|---|
| Starch, Potato Soluble......lb. | .08 | .08½ | .08 | .08½ | .08 | .08½ |
| Rice, 200 lb bbls..........lb. | .07½ | .08½ | .07½ | .08½ | .07 | .08½ |
| Wheat, thick bags.........lb. | .06¼ | .06¾ | .06¼ | .06¾ | .05¾ | .06¾ |
| Thin bags..............lb. | .10 | .10¼ | .10 | .10¼ | .09½ | .10¼ |
| Strontium carbonate, 600 lb bbls wks..................lb. | .07¼ | .07½ | .07¼ | .07½ | .07¼ | .07½ |
| Nitrate, 600 lb bbls NY....lb. | .10½ | .11 | .10½ | .11 | .07 | .11 |
| Peroxide, 100 lb drs.......lb. | .... | 1.25 | ..... | 1.25 | .... | 1.25 |
| Sulfur Brimstone, broken rock, 250 lb bag c-1.......100 lb. | .... | 2.05 | ..... | 2.05 | .... | 2.05 |
| Crude, f. o. b. mines......ton | 18.00 | 19.00 | 18.00 | 19.00 | 18.00 | 19.00 |
| Flour for dusting 99½%, 100 lb bags c-1 NY....100 lb. | .... | 2.40 | ..... | 2.40 | .... | 2.40 |
| Heavy bags c-1.....100 lb. | .... | 2.50 | ..... | 2.50 | .... | 2.50 |
| Flowers, 100%, 155 lb bbls c-1 NY..............100 lb. | .... | 3.45 | ..... | 3.45 | .... | 3.45 |
| Roll, bbls 1c-1 NY....100 lb. | 2.65 | 2.85 | 2.65 | 2.85 | 2.65 | 2.85 |
| Sulfur Chloride, red, 700 lb drs wks..................lb. | .05 | .05½ | .05 | .05½ | .05 | .05½ |
| Yellow, 700 lb drs wks.....lb. | .03½ | .04½ | .03½ | .04½ | .03½ | .04½ |
| Sulfur Dioxide, 150 lb cyl....lb. | .07 | .08 | .07 | .08 | .07 | .08 |
| Extra, dry, 100 lb cyl......lb. | .11 | .13 | .11 | .13 | .10 | .13 |
| Sulfuryl Chloride............lb. | .15 | .40 | .15 | .40 | .15 | .40 |
| Sumac, Italian, ground......ton | 74.00 | 75.00 | 69.00 | 75.00 | 50.00 | 75.00 |
| Talc, Crude, 100 lb bgs NY..ton | 12.00 | 15.00 | 12.00 | 15.00 | 12.00 | 15.00 |
| Refined, 100 lb bgs NY..ton | 16.00 | 18.00 | 16.00 | 18.00 | 16.00 | 18.00 |
| French, 220 lb bags NY....ton | 27.50 | 30.00 | 27.50 | 30.00 | 18.00 | 30.00 |
| Refined, white, bags....ton | 45.00 | 60.00 | 45.00 | 60.00 | 35.00 | 60.00 |
| Italian, 220 lb bags to arr..ton | 70.00 | 75.00 | 70.00 | 75.00 | 48.50 | 75.00 |
| Refined, white bags N.Y.ton | 75.00 | 80.00 | 75.00 | 80.00 | 50.00 | 80.00 |
| Superphosphate, 16% bulk, wks.....................ton | .... | 8.00 | ..... | 8.00 | 6.50 | 8.00 |
| Run of pile..............ton | .... | 7.50 | ..... | 7.50 | 6.00 | 7.50 |
| Tankage Ground NY.......unit | .... | 2.75* | 2.50 | 2.75* | 1.70 | 2.75* |
| Unground ............unit | .... | 2.35 | ..... | 2.35 | 2.35 | 2.60 |
| High grade f.o.b. Chicago.unit | .... | 2.40* | 1.90 | 2.40* | 1.40 | 3.00 |
| South American cif......unit | .... | 3.10* | 3.00 | 3.10* | .... | 2.50 |
| Tapioca Flour, high grade bgs.lb | .03 | .05 | .03 | .05 | .03 | .05 |
| Medium grade, bags.....lb. | .03 | .04 | .03 | .04 | .03 | .04 |
| Tar Acid Oil, 15%, drums...gal. | .21 | .22 | .21 | .22 | .20 | .22 |
| 25% drums............gal. | .23 | .24 | .23 | .24 | .22 | .24 |
| Tartar Emetic, Tech ......gal. | .... | .22¾ | .23 | .23 | .... | .... |
| U. S. P..................gal. | .28 | .28½ | .27 | .28½ | .... | .... |
| Terra Alba Amer. No. 1, bgs or bbls mills.........100 lb. | 1.15 | 1.75 | 1.15 | 1.75 | 1.15 | 1.75 |
| No. 2 bags or bbls...100 lb. | 1.00 | 1.25 | 1.00 | 1.25 | 1.00 | 1.25 |
| Imported bags............lb. | .01⅛ | .01¼ | .01⅛ | .01¼ | .01⅛ | .01¼ |
| Tetrachlorethane, 50 gal dr...lb. | .08½ | .09 | .08½ | .09 | .08½ | .09 |
| Tetralene, 50 gal drs wks.....lb. | .12 | .13 | .12 | .13 | .12 | .13 |
| Thiocarbanilid, 170 lb bbl....lb. | .20 | .25 | .20 | .25 | .25 | .28½ |
| Tin........................ | | | | | | |
| Crystals, 500 lb bbls wks...lb. | .... | .40 | .30 | .40 | .24 | .41 |
| Metal Straits NY.........lb. | ... | .55⅜ | .50⅞ | .55⅜ | .23 | .57 |
| Oxide, 300 lb bbls wks.....lb. | .57 | .59 | .55 | .59 | .27½ | .59 |
| Tetrachloride, 100 lb drs wks ........................lb. | .27½ | .28½ | .25¼ | .28½ | .126 | .28 |
| Titanium Dioxide 300 lb bbl...lb. | .17¼ | .19¼ | .17¼ | .19¼ | .17¼ | .19¼ |
| Calcium Pigment, bbls.......lb. | .06¼ | .06½ | .06¼ | .06½ | .06¼ | .06½ |
| Toluene, 110 gal drs........gal. | .... | .35 | ..... | .35 | .... | .35 |
| 8000 gal tank cars wks....gal. | .... | .30 | ..... | .30 | .... | .30 |
| Toluidine, 350 lb bbls........lb. | .88 | .89 | .88 | .89 | .88 | .89 |
| Mixed, 900 lb drs wks.....lb. | .27 | .28 | .27 | .28 | .27 | .28 |
| Toner Lithol, red, bbls.......lb. | .80 | .85 | .80 | .85 | .80 | .95 |
| Para, red, bbls............lb. | .... | .80 | ..... | .80 | .... | .80 |
| Toluidine .................lb. | .... | 1.35 | ..... | 1.35 | 1.35 | 1.55 |
| Triacetin, 50 gal drs wks.....lb. | .32 | .36 | .32 | .36 | .32 | .36 |
| Trichlorethylene, 50 gal dr...lb. | .09½ | .10 | .09½ | .10 | .09½ | .10 |
| Triethanolamine, 50 gal drs...lb. | .35 | .38 | .35 | .38 | .35 | .38 |
| Tricresyl Phosphate, drs.....lb. | .19 | .26 | .19 | .26 | .19 | .26 |
| Triphenyl guanidine.........lb. | .58 | .60 | .58 | .60 | .58 | .60 |
| Phosphate, drums.........lb. | .37 | .39 | .37 | .39 | .37 | .39 |
| Tripoli, 500 lb bbls......100 lb. | .75 | 2.00 | .75 | 2.00 | .75 | 2.00 |
| Tungsten, Wolframite..per unit | 12.00 | 12.50 | 12.00 | 12.50 | 10.00 | 12.50 |
| Turpentine carlots, N. Y. dock bbls. ................gal. | .61 | .61½ | .47¾ | .63½ | .46¼ | .51½ |
| Savannah, bbls..........gal. | .... | .56 | .42¾ | .58½ | .... | .... |
| Jacksonville, bbls.........gal. | .56 | .56½ | .43 | .58½ | .... | .... |
| Wood Steam dist, bbls, c. l. .. N. Y...............gal. | .... | .53 | .44 | .61 | .42 | .48 |
| Urea, pure, 112 lb cases......lb. | .15 | .17 | .15 | .17 | .15 | .17 |
| Fert. grade, bags c.i.f......ton | 100.00 | 120.00 | 90.00 | 120.00 | 82.60 | 90.00 |
| c. i. f. S. points........ton | 100.00 | 120.00 | 90.00 | 120.00 | 82.60 | 90.00 |
| Urea Ammonia liq. 55% $NH_3$, tanks.................unit | .... | .96 | ..... | .96 | .... | .... |
| Valonia Beard, 42%, tannin bags...................ton | .... | 40.00 | 39.00 | 40.00 | 27.50 | 42.00 |
| Cups, 30-31% tannin.....ton | 26.00 | 27.00 | 23.00 | 27.00 | 17.00 | 25.00 |
| Mixture, bark, bags.......ton | .... | 28.00 | ..... | 28.00 | 22.00 | 28.00 |
| Vermillion, English, kegs.....lb. | 1.60 | 1.73 | 1.41 | 1.73 | 1.05 | 1.42 |
| Vinyl Chloride, 16 lb cyl.....lb. | .... | 1.00 | ..... | 1.00 | .... | 1.00 |
| Wattle Bark, bags..........ton | .... | 30.00 | 30.00 | 34.00 | 24.00 | 32.00 |
| Extract 55%, tanks, bbls...lb. | .... | .05¾ | ..... | .05¾ | .03 | .05¾ |
| Whiting, 200 lb bags, c-1 wks ...................100 lb. | .85 | 1.00 | .85 | 1.00 | .85 | 1.00 |
| Alba, bags c-1 NY........ton | .... | 15.00 | ..... | 15.00 | 13.00 | 15.00 |
| Gilders, bags c-1 NY...100 lb. | .... | 1.35 | ..... | 1.35 | .... | 1.35 |
| Wood Flour, c-l..........bags | 18.00† | 30.00 | 18.00† | 30.00 | 18.00 | 36.00 |
| Xylene, 10 deg tanks wks...gal. | .... | .29 | ..... | .29 | .29 | .29 |
| Commercial, tanks wks...gal. | .... | .26 | ..... | .26 | .... | .26 |
| Xylidine, crude............lb. | .36 | .37 | .36 | .37 | .36 | .37 |
| Zinc Ammonium Chloride powd., 400 lb bbls............lb. | .04¾ | .05 | .04¾ | .05 | .04¾ | .05 |
| Carbonate Tech. bbls NY..lb. | .09½ | .11 | .09½ | .11 | .09½ | .11 |
| Chloride Fused, 600 lb drs wks....................lb. | .04½ | .05 | .04½ | .05 | .05 | .05¾ |
| Gran, 500 lb bbls wks.....lb. | .... | .05½ | .05½ | .06 | .05¾ | .06 |
| Soln 50%, tanks wks...100 lb. | .... | 2.00 | ..... | 2.00 | .... | 3.00 |
| Cyanide, 100 lb drums....lb. | .38 | .39 | .38 | .39 | .38 | .39 |
| Dithiofuroate, 100 lb dr...lb. | .... | 1.00 | ..... | 1.00 | .... | 1.00 |

*&10 †Depends upon grade

| | Current Market | | 1934 Low | 1934 High | 1933 Low | 1933 High |
|---|---|---|---|---|---|---|
| Zinc Dust, 500 lb bbls c-1 wks ... lb. | .0705 | .071 | .0705 | .071 | .04¾ | .07½ |
| Metal, high grade slabs c-1 NY ... 100 lb. | .... | 4.65 | 4.65 | 4.87 | 3.02 | 5.37 |
| Oxide, American bags wk ... lb. | .05¼ | .06¼ | .05¾ | .06¼ | .05 | .06 |
| French, 300 lb bbls wks ... lb. | .05¾ | .11⅛ | .05¾ | .11⅛ | .05¾ | .11⅛ |
| Palmitate, bbls ... lb. | .20 | .21 | .20 | .21 | .17½ | .21 |
| Perborate, 100 lb drs ... lb. | .... | 1.25 | ..... | 1.25 | .... | 1.25 |
| Peroxide, 100 lb drs ... lb. | .... | 1.25 | ..... | 1.25 | .... | 1.25 |
| Resinate, fused, dark, bbls. lb. | .05¾ | .06½ | .05¾ | .06½ | .05¾ | .06½ |
| Stearate, 50 lb bbls ... lb. | .18 | .19 | .18 | .19 | .15 | .19 |
| Sulfate, crystals, 400 bbl wks lb. | .028 | .033 | .02¾ | .033 | .03 | .03½ |
| Flake, bbls ... lb. | .032 | .037 | ..... | .... | .... | .... |
| Sulfide, 500 lb bbls ... lb. | .13 | .13½ | .13 | .13½ | .12 | .13½ |
| Sulfocarbolate, 100 lb keg ... lb. | .21 | .22 | .21 | .22 | .21 | .22 |
| Zirconium Oxide, Nat. kegs ... lb. | .02½ | .03 | .02½ | .03 | .02½ | .03 |
| Pure kegs ... lb. | .45 | .50 | .45 | .50 | .45 | .50 |
| Semi-refined kegs ... lb. | .08 | .10 | .08 | .10 | .08 | .10 |

## Oils and Fats

| | Current Market | | 1934 Low | 1934 High | 1933 Low | 1933 High |
|---|---|---|---|---|---|---|
| Castor, No. 1, 400 lb bbls ... lb. | .... | .09¾ | ..... | .09¾ | .09¼ | .10 |
| No. 3, 400 lb bbls ... lb. | .... | .09¾ | ..... | .09¾ | .08½ | .09¾ |
| Blown, 400 lb bbls ... lb. | .12¼ | .12¾ | .12¼ | .12¾ | .11¼ | .12¾ |
| China Wood, bbls spot NY ... lb. | .08 | .08¼ | .07½ | .08½ | .04⅞ | .09⅛ |
| Tanks, spot NY ... lb. | .076 | .07¾ | .07¼ | .08 | .04½ | .08½ |
| Coast, tanks ... lb. | .07⅜ | .07½ | .06⅞ | .07½ | .04⅛ | .08⅛ |
| Coconut, edible, bbls NY ... lb. | .... | .10¾ | ..... | .10¾ | .... | .10¾ |
| Ceylon, 375 lb bbls NY ... lb. | .03⅝ | .03¾ | .03⅞ | .03¾ | .03⅞ | .04¾ |
| 8000 gal tanks NY ... lb. | .02⅜ | .02⅝ | .02⅜ | .02¾ | .02½ | .03⅜ |
| Cochin, 375 lb bbls NY ... lb. | .04¼ | .04½ | .04¼ | .04⅝ | .04½ | .05¼ |
| TanksN Y ... lb. | .04 | Nom. | .04 | Nom. | .04 | .05 |
| Manila, bbls NY ... lb. | .03⅝ | .03¾ | .03⅝ | .04 | .03⅞ | .04¾ |
| Tanks NY ... lb. | .02⅝ | .02¾ | .02⅝ | .03 | .02¾ | .03¾ |
| Tanks, Pacific Coast ... lb. | .02¼ | .02½ | .02¼ | .02⅞ | .02½ | .03⅜ |
| Cod, Newfoundland, 50 gal bbls ... gal. | .40 | Nom. | 34 | .40 | .19 | .35 |
| Copra, bags, N. Y. ... lb. | .013 | .014 | .013 | .016 | .0152½ | .019 |
| Corn, crude, bbls NY ... lb. | .05⅞ | .06 | .04⅝ | .06 | .04⅜ | .07¾ |
| Tanks, mills ... lb. | .04⅝ | .04¾ | .03½ | .04⅞ | .02⅞ | .06½ |
| Refined, 375 lb bbls NY ... lb. | .06⅞ | .07¼ | .05¾ | .07¼ | .05¾ | .08¾ |
| Cottonseed, crude, mill South-east & Valley ... lb. | (See Oils and Fats News Section) | | | | | |
| Texas ... lb. | (See Oils and Fats News Section) | | | | | |
| Degras, American, 50 gal bbls NY ... lb. | .02¾ | .03 | .02¾ | .03 | .02½ | .03 |
| English, brown, bbls NY ... lb. | .04¼ | .04½ | .03¾ | .04 | .02⅞ | .04 |
| Greases, Brown ... lb. | .02½ | .03 | .02 | .03 | .02 | .03⅛ |
| Yellow ... lb. | .03⅛ | .03¼ | .02⅜ | .03¼ | .01¾ | .03⅝ |
| White, choice bbls NY ... lb. | .03¼ | .03⅞ | .02¾ | .03⅞ | .02½ | .04⅝ |
| Herring, Coast, Tanks ... gal. | .15 | Nom. | .15 | 15 | .11 | .23 |
| Lard Oil, edible, prime ... lb. | .... | .09¾ | ..... | .09¾ | .08½ | .10½ |
| Extra, bbls ... lb. | .... | .07¾ | ..... | .07¾ | .07½ | .08¼ |
| Extra No. 1, bbls ... lb. | .... | .07½ | ..... | .07½ | .06 | .08 |
| Linseed, Raw, lessthan5bbl.lots lb. | .... | .101 | .101 | .105 | .08 | .12 |
| Bbls c-1 spot ... lb. | .... | .097 | .093 | .097 | .072 | .11 |
| Tanks ... lb. | .... | .091 | .087 | .091 | .066 | .104 |
| Menhaden Tanks, Baltimore. gal. | .16 | .20 | .15 | .17 | .09 | .15 |
| Refined, alkali bbl ... lb. | .063 | .069 | .063 | .069 | .... | .... |
| Tanks ... lb. | .... | .059 | .059 | .061 | .... | .... |
| Light Pressed, bbls. ... lb. | .051 | .057 | .051 | .057 | .... | .... |
| Tanks ... lb. | .... | .047 | .047 | .049 | .... | .... |
| Neatsfoot, CT, 20° bbls NY ... lb. | .... | .16½ | ..... | .16½ | .11¾ | .16¾ |
| Extra, bbls NY ... lb. | .... | .07¾ | ..... | .07¾ | .06½ | .08¼ |
| Pure, bbls NY ... lb. | .... | .12 | .12 | .13 | .07¾ | .14 |
| Oleo, No. 1, bbls NY ... lb. | .... | .06⅛ | .06⅛ | .06½ | .05 | .06⅞ |
| No. 2, bbls NY ... lb. | .... | .05⅜ | .05⅜ | .05⅞ | .04¼ | .06⅜ |
| Olive, denatured, bbls NY ... gal. | .88 | .90 | .76 | .90 | .47 | .80 |
| Edible, bbls NY ... gal. | 1.75 | 1.90 | 1.60 | 1.90 | 1.30 | 1.85 |
| Foots, bbls NY ... lb. | .06¾ | .06⅞ | .06½ | .06⅞ | .04⅜ | .06¾ |
| Palm, Kernel Casks ... lb. | .04¼ | Nom. | 04¼ | Nom. | .04 | .04¾ |
| Lagos, 1500 lb casks ... lb. | .... | .03⅞ | .03⅝ | .03⅞ | .02⅝ | .04¾ |
| Niger, Casks ... lb. | .03⅜ | .03½ | .03⅜ | .03¾ | .024 | .04½ |
| Peanut, crude, bbls NY ... lb. | .... | .07¾ | .06½ | .07¾ | .03⅛ | .07 |
| Refined, bbls NY ... lb. | .08½ | .10 | .07½ | .10½ | .07½ | .11 |
| Perilla, bbls NY ... lb. | .09 | .09¼ | .08½ | .09¼ | .05 | .10½ |
| Tanks, Coast ... lb. | .08 | Nom. | 07½ | .08 | .03¾ | .09¾ |
| Poppyseed, bbls NY ... gal. | 1.50 | 1.60 | 1.45 | 1.60 | 1.45 | 1.70 |
| Rapeseed, blown, bbls NY ... gal. | .08 | .082 | .08 | .082 | .... | ... |
| denatured, drms, NY ... gal. | .42 | .43 | .41½ | .44 | .34 | .65 |
| Red, Distilled, bbls ... lb. | .07 | .07⅜ | .07 | .07⅜ | .05⅞ | .07⅜ |
| Tanks ... lb. | .... | .06 | ..... | .06 | .05 | .06 |
| Salmon, Coast, 8000 gal tks. gal. | .15 | Nom. | .15 | .17 | .11 | .18 |
| Sardine, Pacific Coast tks ... gal. | .... | .20 | .13 | .20 | .09½ | .20 |
| Sesame, edible, yellow, dom. . lb. | .07½ | .08 | .07½ | .09 | .08½ | .10 |
| White, dos ... lb. | .08 | .08½ | .08 | .09½ | .10 | .11 |
| Sod, bbls NY ... gal. | .... | .40 | ..... | .40 | .... | .40 |
| Soy Bean, crude ... | | | | | | |
| Pacific Coast ... lb. | .... | Nom. | ..... | Nom. | .032 | .035 |
| Domestic tanks, f.o.b. mills, lb. | .... | .06½ | .06 | .06½ | .027 | .085 |
| Crude, bbls NY ... lb. | .071 | .075 | .066 | .071 | .04 | .095 |
| Refined, bbls NY ... lb. | .076 | .087 | .071 | .087 | .04½ | .106 |
| Sperm, 38° CT, bleached, bbls NY ... lb. | .108 | .11 | .108 | .11 | .... | .... |
| 45° CT, bleached, bbls NY ... lb. | .101 | .103 | .101 | .103 | .... | .... |
| Stearic Acid, double pressed dist bags ... lb. | .09½ | .10 | .09½ | .10 | .07½ | .10 |
| Double pressed saponified bags ... lb. | .09½ | .10 | .09½ | .10 | .08 | .10 |
| Triple, pressed dist bags ... lb. | .12¼ | .12¾ | .12¼ | .12¾ | .10½ | .12¾ |
| Stearine, Oleo, bbls ... lb. | .05¾ | .05⅞ | .05 | .05⅞ | .03½ | .06¾ |
| Tallow City, extra loose ... lb. | .... | .03½ | .02⅞ | .03½ | .02 | .03⅞ |
| Edible, tierces ... lb. | .... | .04¾ | ..... | .04¾ | .03½ | .05⅛ |
| Tallow Oil, Bbls, c-1 NY ... lb. | .05¾ | .06 | .05¾ | .06 | .05¾ | .06 |
| Acidless, tanks NY ... lb. | .... | .06¾ | ..... | .06¾ | .05 | .07¼ |
| Vegetable, Coast mats ... lb. | .06 | Nom. | .06 | Nom. | .04½ | .06 |
| Turkey Red, single, bbls ... lb. | .07½ | .... | .07½ | .... | .06¼ | .07½ |
| Double, bbls ... lb. | .12½ | .13 | .12½ | 13 | .08 | .13 |
| Whale, ... | | | | | | |
| Winter bleached, bbls, NY ... lb. | .... | .072 | ..... | .072 | .... | .... |
| Refined natural, bbls, NY ... lb. | .068 | .07 | .068 | .07 | .... | .... |

## *Index to Advertisers*

# "We"—Editorially Speaking

A chemical merchant of Calcutta writes: "It is not out of place to mention that recently some of the Government railways, municipalities, jute and cotton mills are specializing in American-made articles, not only for cheapness but for reasons best known to the universe"—that's telling the cock-eyed world.

Among the many compliments which we received on our editorial on partnership between government and business was one vigorous complaint which took the practical form of cancellation by "an irate subscriber". The point of his protest was dulled somewhat due to the fact that as publicity agent for one of the large manufacturers he had been receiving a complimentary copy.

An inquisitive broker from Wall Street has been inquiring in chemical circles as to what was liquidated and when, in order to retire the preferred stock of the Solvay Investment Corporation.

As a well-known authority on the problems of industrial taxation, Mr. Staub's paper on pending tax legislation and the changes brought about in our federal tax laws, particularly the income tax, by the N. R. A., decisions of the courts and the Board of Tax Appeals, and Treasury rules and regulations, is most timely and pertinent. It was recently delivered at a meeting of the New York Chapter, National Association of Cost Accountants. He is the author of numerous texts and articles in the fields of taxation and audits; has lectured at Columbia and New York Universities and frequently addressed various business and professional organizations. President, the New York State Society Certified Public Accountants.

Hailing Secretary Wallace's paper, *Business Week* says: "He suggests that at least we try the novel experiment of adopting a consistent long-term tariff policy, and then proceeding to follow it." Our present policy of protecting American industries by equalizing cheaper foreign labor dates back to Alexander Hamilton and has been followed except for Democratic interludes.

And still quoting from *Business Week:* "The President's approach is equally realistic. In his office already rests authority to revise tariff rates upward or downward by 50 per cent. But now he must await the findings of the Tariff Commission, and the commission must take due account of 'cost of production'. In other words, the industries with the least economic justification are to be given the tenderest consideration. The President asks authority to short-cut the commission proceedings, in the interest of quick action, and abolish the cost or production formula in the interest of common sense."

Says *"Chem & Met"* published very same month: "The powers the President has asked from Congress seem, at first glance, to be not greatly different from those now given him in the so-called "flexible" tariff provisions which the Supreme Court has held to be constitutional. But there is the very significant difference that under present law an investigation of all the facts must be made, public hearings must be held, and the Presidential action is taken only on the studied recommendation of the Tariff Commission."

All of which would seem to indicate that McGraw-Hill's left hand does not know what the right hand is writing.

Since 1931 Joseph C. Elgin has been in active charge of the chemical engineering research work and department at Princeton. During this same period he has also been consultant on friction material development and manufacture to the Thermoid Rubber Company, and director of the Fundamental Research Project on this subject at Princeton, sponsored by Thermoid. Previous to this, he was chemical engineer in the control laboratory of the Johns-Manville plant at Manville, N. J. He is the author and co-author of numerous papers on contact catalytic reactions and gas adsorption, and photochemical reactions; holds degrees and fellowships too numerous to mention; and has made a thorough study of semi-plant scale operation and design.

At that point of the depression when the public appeared to forget such things as investments existed, Fred. Hessel left Rothschild & Company, and started a chemical specialty business which has proven highly successful. Indeed so successful did it prove that it was with considerable reluctance that he returned to Rothschild several months ago, for the two positions required top speed and sixteen hours a day. NRA please note.

Charles F. Mason, Ph. D., who is now associated with C. P. Harris, Ph. D., consulting chemists and engineers, attended Syracuse and Columbia Universities. He has done technical work for du Pont and American Cyanamid, and has been a member of the teaching staffs of New York University and Notre Dame.

The Fashion Group's exhibit and the exhibit of the Industrial Arts Group, both at Radio City, as well as the exposition of industrial chemicals staged by the Newark Museum are well-worth the time required to view them. And from attendance figures reported from all three it is quite evident that the public's interest in chemicals and their uses continues to expand at a rapid and most encouraging rate.

From our contemporary the *Fertilizer Journal*, (British) we learn that recently a London newspaper carried the following: "Platinum is employed for industrial purposes as well as in the manufacture of jewelry. It also provides an important agricultural fertilizer in the form of artificial nitrate, produced by the combination of platinum with the oxygen of the air." Presumably nitrogen is the catalyst employed in this secret process!

To keep the records straight Dr. William Stericker, of Philadelphia Quartz, is the right author of the article on "Silicates of Soda for Ceramics" which appeared in our February issue. We inadvertently gave the credit to Mr. Vail, also of the same company.

## *Fifteen Years Ago*

**From our issues of April, 1919**

**Critical dye situation forces discussion on protective tariff for dyestuffs in preference to license system.**

**Dr. M. C. Whitaker discovers fuel substitute for gasoline patented under the name of "alcogas".**

**Dye Division of American Chemical Society formed with object of making U. S. independent of German dyestuffs.**

**Unusual opportunities to participate in profit-sharing offered employees by several chemical companies.**

**One hundred and fifty employees Heyden Chemical declare strike, demanding 48 hour week and ten per cent. wage increase.**